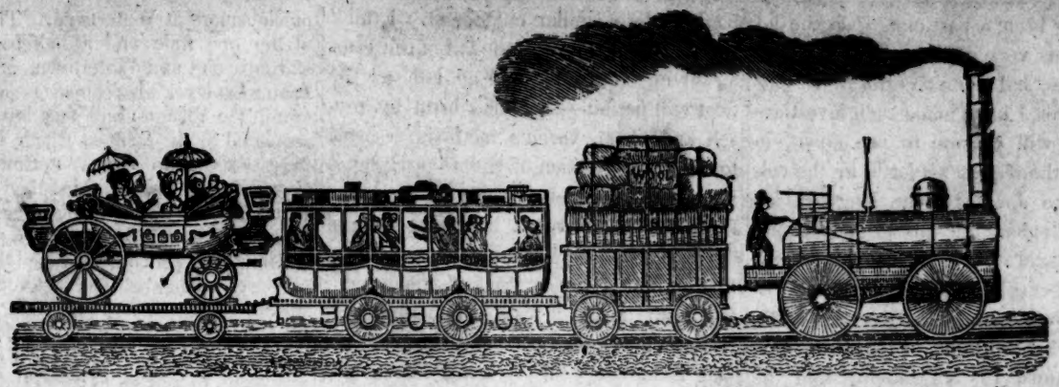

AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE

D. K MINOR, and GEORGE C. SCHAEFFER, { EDITORS AND PROPRIETORS.] SATURDAY, DECEMBER 17, 1836. [VOLUME V.—No 50

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, DECEMBER 17, 1836.

We have been referred to several gentlemen of high standing in the profession, as to the abilities and skill of the advertiser.

He has twice made the tour of the United States for professional information, and has been engaged upon the Ottawa and Ridean Canals, and upon other works in the British Provinces.

An English Engineer, who has had the advantage of some experience, and is in possesion of good testimonials, is desirous of being employed on a Railroad, or under an Engineer of character in the United State, as Assistant.

Address this office—post paid.

50—3t

An Engineer is desirous of obtaining a situation, on some work, either Railroad or Canal; he would have no objections to go on to any part of the United States.

Satisfactory references given as to character and capacity. Address W. H. W. at this office—post-paid. 504t

Particular attention is requested to the Circular of Mr. Norris commencing on page 797.

The lectures of the Mechanics' Institute commenced on the 8th of this month.

The lecturers are Drs. Wallace, Gale, Crandall, and Welden, Professors Torrey, Cummings, Mapes, Dunlap, Mason and Bush, Messrs. Bruce, Bartlett, Mills, and Chapin.

From the reputation of these gentlemen in their various departments, we are led to expect a course of excellent lectures.

The room chosen, is a good one, and in an eligible situation, the lecture room of the Lyceum of Natural History, in Broadway, near Prince-street.

The evenings selected are Mondays and Thursdays.

AMERICAN LOCOMOTIVES.

It gives us pleasure to find that the work shops of our own country are already rivalling, if not excelling, those of England in the article of locomotive engines. It has been but a few years since this manufacture was started in the United States; but in that short period the talent of our countrymen has been more favorably developed. We took occasion lately to publish a certificate from Wm. R. Lee, Esq., the superintendent o. the Boston and Providence Railroad, relative to the fine performance of an engine built by E. A G. Young, the superintendent of the New-Castle Manufacturing Company.—Another locomotive from the same shop has been within a few months placed upon the Boston Road, which by the annexed extract of a letter from Mr. Lee appears to be one of superior excellence, and which with a great capacity to make steam combines much economy in the consumption of fuel. The power to generate a snfficient supply of steam is a matter of high importance in these machines, and when that object is attained with a diminished supply of fuel it must give such an engine a great advantage; enabling it to exert the same power at a much less expense. The decided approbation of a gentleman of Mr. Lee's knowledge and experience, and coming too, from a quarter where the best engines of either English or American make are in use, cannot fail to extend the reputation of Mr. Young as a builder, and to attach to the locomotives sent out by the New-Castle Company a just celebrity.

For the American Railroad Journal.

PROVIDENCE, Nov. 26, 1836,
Office B. and P. R. R. Co.

Mr. E. A YOUNG,

DEAR SIR,—It gives me pleasure to assure you of my entire satisfaction with the performance of "Young No. 2," she answers our wishes fully. The capacity of your engines to make steam with *great* economy of fuel, is undoubted, and while I am not inclined to give a comparative view in this respect of engines from *different* shops. I do not hesitate to say that in my experience, your machines have a great advantage in the economy fuel."

Very respectfully,
W. RAYMOND LEE.

For the American Railroad Journal.

MR. D. K. MINOR.—Dear Sir,—being a subscriber to your valuable and interesting Journal, I am favored with the perusal of comments, (extracted from the Journal of the Franklin Institute,) on the production and manufacture of Salid, or Table Oil, in the United States, to be procured from the seeds of Poppy; requesting information relative to what is already considered a very interesting part of French Husbandry, &c., being

and having been, a participator in the interest of this very important inquiry, and being a practical manufacturer of various kinds of Oils, I have made such investigations, as I will venture to pen down, in answer to the request set forth in the columns of the Journal of the Franklin Institute, and submit the same to you for publication, should it meet with such approbation as will entitle it to a place in the columns of your Journal. In December 1824, Mr. Daniel Markham, of Madison Co., N. Y. obtained Letters Patent, from the Government of the United States, for the discovery and art, of manufacturing Oil from the seed of Poppy, to be used for culinary, and many other important purposes. But ignorance and prejudice, being predominant in the minds of those who have been addressed on this subject, sickness and indigence on the part of the enterprizing projector, have ever held in check, the advancement of this important object in this country, for which reasons, it is believed, the patentee has just claims for a renewal of his patent, for seven years after the original has run out, to effect which, I believe, he is about to take preliminary measures. Myself and others, have from repeated trials, ascertained that 100 bushels of Poppy Seed can be procured from one acre of good land, after allowing amply for waste, &c. Doctor L. Bishop, of Oneida County, has raised the present season, at the rate of 147 bushels per acre, with taking very little pains in cultivation. This may seem to be, (in the minds of many,) an absurd exaggeration, but it is no less strange than true, and one bushel of this seed, will yseld from eight to twelve quprts of oil of the first order; possessing (when drawn cold and pure,) a transparency equal to the best spring water, and a flavor far more delicious than the Olive; it is extremely limpid, and never chills with frost. The present price of this Oil in the City of New-York, is 50 cents perpint, and is saught after, by the portrait painters, being the finest and best Oil for their business. When burnt in a lamp, it sends forth a brilliant flame, and emits but little smoke; its medicinal qualties are mild, harmless, though effective in many cases, as proved by practice—it seems to possess none of the narcotic quality of which the poppy is so abundantly supplied, but seems to be admirably calculated for the table, and I doubt not. but the time is near at hand, when the genteel portion of our community, may oil their palates from the production of their own soil, and no longer be under a compliment to France, Flanders, or any other foreign country, for a similar enjoyment. I think the most proper time is the fall of the year, for sowing the seed, and as late as the frost will permit—there has been by myself and others, various methods resorted to, for the cultivation of the Poppy; but I venture to say the best mode is yet verry far in the shade; but I hope that some of our agriculturists will take the trouble to appropriate a small piece of land, and a few hours time by way of experiment on this new piece of husbandry, (however trivial it may appear at first,) I doubt not they will be highly pleased and amply rewarded for their pains.

Sir, I am with much esteem,
very sincerely your humble servant.
E. S. S.

Paris, Oneida Co., N. Y. Oct. 1836.

REPORT ON THE SURVEY OF A ROUTE FOR A RAILROAD FROM WATERTOWN TO ROME.

BY WILLIAM DEWEY, ESQ. TO

ORVILLE HUNGERORD, ANDREW Z. MCCARTY
WILLIAM SMITH, JOHN H. WELLS,
G. C. SHERMAN, AMBROSE CURTISS,
H. H. COFFEEN, S. N. DEXTER,
EDMUND KIRBY, LINUS PARKER,
S. B. ROBERTS, CALEB CARR,
JESSE ARMSTRONG, AVERY SKINNER,
HIRAM HUBBELL,

Commissioners of the Watertown and Rome Railroad.

GENTLEMEN:—The examinations, undertaken for the purpose of ascertaining the cost of constructing a Railroad from Watertown, on the Black River, to Rome, on the Erie Canal, are now completed; and it affords me much pleasure to present the very favorable results of my explorations.

As soon as practicable, after the survey was committed to my charge, I organized two parties of Engineers: one under the direction of Mr. Robert F. Livingston, and the other under that of Mr. James Roberts, Engineers of ability and experience, and to whose exertions I am greatly indebted for the opportunity of now presenting an accurate estimate of the probable cost of the Road.

As the object of the survey was to make such examinations as would enable the Commissioners to state, decidedly, to those disposed to make investments in the stock, that a good road could be constructed for a certain maximum sum, my proceedings, have been regulated by that consideration. Such preliminary explorations were made as indicated the most favorable direction for our purpose; and, in that direction, a regular survey was conducted, with sufficient precision to enable me to state, with confidence, the absolute cost of construction, if the road were located upon the line thus examined.

Our operations were commenced at a point, near the road leading from Watertown to Adams, in the vicinity of an old distillery; and about one mile and a half from Watertown. This point is elevated 056.025 feet, above the level of Lake Ontario, which has been made the plane of reference upon the accompanying profiles; and also 37.925 feet above the level of the pump on the public square at Watertown. The location of the one mile and a half between our starting point and Watertown, will depend upon what level it is deemed requisite to attain in the Village; and this level must be regulated by the point at which it is found most advisable to leave Watertown with the Cape Vincent Railroad, designed to constitute a continuation of this improvement, and form a means of access to Upper Canada.

Since it had been determined that our line of survey should proceed as directly as possible to Adams; and as we were aware that the level of that Village was about 115 feet above our point of departure, it was judged expedient, to ascend, at once, to the vicinity of what has been designated "the Ridge." We found the summit of the highest Ridge to be about 400 feet above Lake Ontario. Its formation offers a curious subject for Geological investigation. It is remarkably uniform, and is supposed to have constituted, in past ages, the shore of some great inland sea, whose surface lay far above those mighty forests, and fertile plains, that now form some of the richest portions of our State.

Frequently three or four successive ridges are plainly developed, varying in level from 15 to 20 feet, which it demands no extraordinary reach of imagination to suppose have been formed by successive subsidences of this immense sea, as barrier after barrier gave away, until, at length, by some violent convulsion of nature, the collected waters burst their fetters, and through the valley of the Hudson, and of the St. Lawrence forced a passage to their mother ocean.

Evidences, many and strong, to support a supposition of this nature, abound in every section of this region.

In the course of our explorations, from possessing a knowledge of their elevation, these ridges were a sure guide to determine the relative heights of different points that occurred on our route.

A more beautiful site, for the location of a Railroad, could not be desired, than the summit of these ridges, were not the uniformity of their course frequently broken by sharp angles, and interrupted at intervals by deep gullies, caused by the long continued action of small streams carrying away the very light material of which they are composed.

The slope from the ridges in many places, is regular and gradual, until the elevation is reduced to 300 feet above the Lake, when it becomes broken, and unsuitable for our purpose.

This ridge we found to extend on the line of our survey about 30 miles from the point where we were first enabled to avail ourselves of its advantages.

After running, for some distance, to the right of the travelled road to Adams, we followed through a favorable depression a route by which we crossed the Road, and approached the valley of Stony Brook; this we crossed, but at a point which subsequent investigation has shown could be improved—a heavy embankment of some length is here necessary; and indeed this starting line presents several embankments of considerable extent.

Continuing, for a short distance, over uneaven ground, we at length struck the

slope from the ridge; and pursuing it on a rising grade, passed near the tavern of N. Talcott, on the Adams road, seven miles from Watertown; and crossed the Brook, south-west of his house, between the bridge at the road, and the saw mill.

To attain this point we had constantly risen since we left Stony Brook, but at no point did we exceed 33 feet per mile.

In this distance considerable limestone rock is met, but in locating, I have avoided the necessity of cutting, by embanking at the points it is presented, and only removing the highest ridges that are composed of a loose soil.

The embankments are mostly made from side hills, easy of access, and, where we have calculated to use them, composed of light sand and gravel.

Our general course to attain this point was S. 45°W. a few curves will occur, but projected from radii of great extent; and I may here mention, in reference to the entire line, that, at no place will we be compelled to submit to radii of objectionable curvatures.

By assuming a position near Talcott's Mill, and glancing at the country below, at becomes evident, that, to reach Adams Village, we are imperatively compelled to attain this point—the ground to the West falls off very rapidly, and is broken into vallies and ridges, that forbid a passage in any other direction, if it is desired to maintain the level near the ridge.

It had been suggested, that the route to Adams might be improved, by pursuing a more easterly direction from Watertown—striking the valley of the North Branch of Sandy Creek, and following it to Adams; but although our explorations showed that the valley would afford a feasible line, could it be attained, yet, it was demonstrated that it could no where be reached nearer than Adams itself, without resorting to heavier ascents than the maximum grade we had adopted.

Passing from Talcott's mill through a short range of light woods, the line crossed the Adams road, and presently returned. Our course still ranged S. 45° W., and was quite direct, excepting an occasional gentle inclination to the left, to maintain our side-hill elevation.

Immediately after leaving Talcott's mill our profiles show a quick descent, and, soon after, nearly as rapid a rise, and some embankment, but much of this could be avoided by keeping closer to the side-hill. Points of rock show themselves still further to the East, but there exists no necessity for excavating a yard of rock, unless it be for the purposes of culverts.

Near Heath's Creek we descend for 37 chains to the place of crossing—thence we pursue our course, on a line almost naturally prepared, over a light sandy soil, and upon an easy grade until we attain a point 11 miles from the starting station. This last run lies at the foot of the ridge, on the borders of heavy woods of White cedar, Rock-elm, Black-ash, and Hemlock.

From Heath's Creek to within a mile of Sandy Creek at Adams, our profiles do not show an average grading of eighteen inches.

Arrived in the vicinity of the North Branch of Sandy Creek, it became a question to determine the most advisable place to cross the valley of this Creek. Explorations were made in different directions to enable us to approach nearer the centre of Adams village; while the regular survey was carried, by the aid of a ravine, that most opportunely presented itself, at a favorable point, across the valley, and struck on the south bank, ground similar to that followed by our line from the north.

To diminish the height of embankment and of trestling, and also the depth of excavation, I have placed upon the profiles a grade of 33 feet per mile. The sudden occurrence of vallies of this discription—their great width, and their depth below our general line of level, render it imperative, either to resort to a grade, equal to that I have selected, or to make, at an increased expense, deeper cuttings and heavier embankments.

To effect this crossing we have an excavation 42 chains in length, and of an average depth of 8 feet, while the embankment, bridging, or trestling, will be 33 chains in length, and 16 feet in height.

The grade can be reduced by deepening the excavation, or by elevating the embankment, but subsequent examination convinced me that, by crossing the valley at a yet greater distance from Adams Village, the grade could be made less than 30 feet per mile, and without accruing any additional expense.

By the lines of examination, made about Adams, a feasible route was indicated, crossing the road east of the church, and passing the Creek above the upper Mill Pond. By adopting this line the amount of bridging would be diminished; but I apprehend the expense would be more than proportionably increased, by the additional cutting, that would be necessary.

Another plan suggested was to curve to the east at the point our excavation commences; and by making a semi-circular sweep, touch the western part of the village, and arrive at the opposite bank of the valley. But, to effect this, we should be necessitated to descend and rise rapidly, while the objections are increased by adding curves of small radii.

More extensive examinations may, however, develope a favorable line, originating on a high level near Heath's Creek, east of the point at which we crossed, and passing through the upper part of the village, at an additional expense not objectionable, over the line first adopted.

The crossing of the valley was effected not much over a quarter of a mile west of the village, and a branch rail-way, would cheaply secure every advantage.

From the south bank of the valley we proceeded towards Mannsville, still keeping at the foot of the ridge, and bordering on heavy woods. By curving to the west, much of the rise and fall, shown upon this section of the profiles, could be avoided but I question whether any reduction could be effected in the expense.

Much of this range of land inclines to the west, and for a certain distance, a choice of level can be had, but it soon breaks into irrregular shapes, and is cut up by deep ravines—the bridging of which would be far more formidable, than to resort to grades of twenty-five to thirty feet per mile.

Some time was occupied in examining for a crossing place at the South Branch of Big Sandy Creek. By going to the east of the course we had pursued, and which was direct to Mannsville, we should be involved in difficulties, from which there would be no escape. An examination to the west, presented no advisable point, unless we returned, and crossed the valley of the north Branch, far west of Adams, and on a much lower level. Accordingly I carried out the line, on a spur of the ridge, and crossed the mill pond, east of the old brick store, at the junction of the roads near Gidding's tavern. The distance is 12 chains, and the depth from thirty-five to forty feet.

Continuing our line across the road, we struck upon a range of large stones or boulders, mostly of a primitive formation, that we traced for several miles. Their presence in this locality affords matter for interesting speculation. They lie at the foot of the ridge, and at the head of a great plane that slopes to the west—the heavier masses are nearer the Lake, which is distant about six miles, and the smaller stones lie high on the slope of the ridge. Do we not here behold what must now be the appearance of the bottom of Lake Ontario, receding from the shore? The light gravel and sand thrown in ridges on the beach; the smaller stones upon the verge of the water; while, below its bed and distant from the shore, lay rocks and boulders, tossed so high up the slope that the pressure of the water could no longer move them to and fro; we are here about 350 feet above the lake. As these stones were quite massive and deeply imbedded, their removal is avoided by striking a series of short grades, and embanking wherever they are presented. We still continued without any difficulty, upon a direct course, excepting a few gentle curves to conform somewhat to the sinuosities of the ridge, until we past the lands of Wm. C. Pierpoint Esq., about a quarter of a mile west of his mansion. A gradual descent was then commenced, and Skinner's Creek struck west of Mannsville. This creek forms a deep ravine through the sandy ridge, at least fifty feet below our grade line, and is crossed by a bridge nine chains in length.

An attempt was made to pass through Mannsville, upon the level of the principal street, but it proved to be higher by about seventy feet, than was expedient, and would have compelled us, as far as our examinations showed, to cross two formidable gulfs. By falling to the west, until these gulfs unite, the crossing is found to be favorable.

Proceeding, upon a moderate descent, through a dense forest, we reached French's Creek, which we passed west of the travelled road: and again entered an extensive wood, which we followed, nearly parellel to the road, until we reached Little Sandy Creek at Washingtonville.

An embankment and a short cutting bring us to the Creek. Here our bridge is 12 chains in length.

From Sandy Creek to Pulaski, we still continued upon a descending grade. Cuttings and embankments of a moderate depth occur. Passing through the western part of the village, we curve to the left, and cross Salmon River, in the rear of the Court House, by a bridge 2.60 chains in length; which is the only bridge on this section of the road; and, in connection with the very slight work necessary for grading, particularly from Pulaski to Pineville, causes it to be the cheapest section on the entire route

At Washingtonville we were 278 feet, and at Pulaski, 131 feet, above Lake Ontario, and distant from its shore three miles 73 chains. From Pulaski to Pineville we proceed to the right of the travelled road, and in a direction south of east. At Pineville our grade is 291 feet above the Lake level.

Until we reached Pineville, our course had not been difficult to explore; but from Spooner's tavern at Pineville, to Fuller's tavern in Williamstown, we encountered many obstacles, and much time elapsed before a feasible line could be discovered. Long continued wet swales and swamps, interminable forests, stretching for miles in every direction, and covered with pines, in many cases upwards of six feet in diameter, so completely concealed the character of the country from the eye, that it was only by patient and oft renewed researches, running many fruitless lines, and perambulating the entire section, many miles square, that, at length, a practicable route, rewarded the determination with which the examination was prosecuted. I cannot forbear an allusion in this place to the zeal and energy displayed by my principal assistant, Mr. R. F. Livingston, to whom this portion of the survey was confided, and to whose activity and intelligence, I am indebted, for the favorable result of the exploration in this wild region.

The general course, upon which the survey was finally protracted from Pineville, was S. 45° E., passing near the junction of the Oswego and Pulaski stage roads, and thence running, nearly parallel to the Rome road, to the vicinity of the Williamstown Mills, on the West Branch of Fish Creek.

The highest level, attained in the course of the survey, was about two miles and a half north of Fuller's tavern, where we were 410 feet above the plane of reference.

In falling from the Williamstown plains into the valley of the West Branch of Fish Creek, we are compelled to submit to considerable cutting, and to a long and heavy embankment. The proximity of the Creek, and the necessity of crossing frequently, has led me to estimate much of this embankment, as effected by trestling or bridging.

The course of this valley was pursued for ten miles, on a grade, no where exceeding five feet per mile, until we reached Camden village. The hill called the Hog's Back was flanked at its upper extremity with very slight cutting; and for the entire distance, ground, that required excavation, was touched only when it was needed for the embankment estimated through the valley.

From Camden we followed over the mill pond, west of the village, and upon the surface of a beautiful plain, until we approached Little river. An examination of the valley of this river convinced me that it was impracticable to pass it at any reasonable cost, since, at the most favorable position, its banks were twenty chains apart, and its bed from 50 to 60 feet below our level But, in whatever manner we endeavored to prosecute our survey, we found that much heavy work must necessarily be encountered. Deep cuttings and heavy embankments, on our maximum grade, and frequent crossings of the creek, are the characteristics, for the distance of two miles, until we reach McConnellsville, distance five miles from Camden, and thirteen from Rome. Leaving McConnellsville, at our right, we still followed the valley of the West Branch, until we reached the clearing called the "Forks," on the East Branch of Fish Creek, about two miles below Taberg. Here, near the bridge, on the old State road, by embanking upon the flats, crossing Fish Creek by a high bridge, and excavating a distance of 60 chains, an average depth of 12 feet, through a very light sandy soil, we rise to a plain, which we follow, pursuing our course nearly parallel to the road from Taberg to Rome; passing half a mile south of the tavern of Delos Taft, crossing West Creek near the house of David Brown Esq., and Canada Creek near the Coonradt settlement, on an excellent line, demanding but little grading, until we enter the main street of Rome. Our profiles and estimates do not extend beyond the U. S. Arsenal at the head of the street.

A line more level than that presented on the profiles, at the entrance into Rome, might be attained by curving to the South The difference of expense would be but trifling. Our courses have indicated that a line entirely straight, for about eight miles, could be carried from the vicinity of Tafts tavern into the principal street of Rome, and it becomes a question for future consideration to determine, whether it would not be preferable, to secure such a long continuation of straight line, to attain one more level by curving.

To those acquainted with this section of country, it may be well to state that, until we pass Williamstown, the ground, in all cases, to the left of the course we pursued, rises rapidly, consequently, to reach Rome from Watertown, were we to attempt pursuing a direct line we should be compelled to have recourse to grades upon which the useful effect of locomotive engines would be greatly diminished, or to resort to that unpopular method of railroad construction, inclined planes and stationory engines. For this reason, only upon a route, comparativety circuitous, can a road be constructed, against the location of which, the objection of steep grades, cannot be advanced.

In addition to the line of which a description has been presented, experimental explorations were made in various directions, and many others would have been made provided our time and facilities allowed.

It will be perceived that, after leaving Mannsville, our levels continued to fall below what I have designated as the level of the ridge, until we reached Pulaski. This departure from the course we had previously been pursuing, did not increase our difficulties, or add to the cost of construction. Proceeding east from Pulaski, up the Salmon River, we discovered the ridge again near Pineville, but beyond that point it could no longer be traced.

Hills and valleys of the most irregular character, and the dense forest, entirely prevented onr detecting the least indication of its existence, south of the Salmon River. I should not, however, be surprised if future examinations should again discover and trace its course through the centre of the town of Albion, the northern part of Parish, and then turning east, pass through Williamstown into Oneida county. I perceived signs of its presence near the Mills at Fish Creek, but its uniformity was so completely destroyed, that it was no longer favorable to our purpose.

While the office duties were proceeding, I directed Mr. Livingston to carry a line of survey from the vicinity of Sandy Creek, above Washingtonville, to Pineville, on the Salmon River, to connect with the line previously carried through Pulaski—this route followed the ridge which still maintained its favorable character. The distance was found to be two miles 60 chains shorter than by the way of Pulaski—but the crossing at Salmon river was much more formidable. This line would avoid the depression in the grade otherwise encountered, but would carry us still further from the Lake, it being distant nearly eight miles. From Mr. Livingston's notes I have prepared a seprrate estimate of its cost which is presented. I would however premise that this examination was hastily made, and that more time and care might indicate a less expensive line.

From the Cultivator.

ROAD MAKING.

No branch of public improvement is of more importance to the farmer, nor indeed to the community at large, than the bettering of our common roads, particularly those which constitute the main avenues to market. These are the great arteries which transmit life, and vigor, and health, to every part of the business community. Our turnpikes have proved a failure, from a mistaken parsimony in their construction, and their needless multiplication. Railroads will do upon the great thoroughfares of commerce and travel; but for the transaction of internal commerce between the great towns and the country, good public roads should have precedence over all others: Because they dispense their benefits to all alike, and exempt us from the mortifying impositions of chartered wealth, and the officious impertinence of a host of subordinate officers. It is upon these public

roads that the immense products of our farms are transported, and that we mostly receive in return the foreign commodities which we consume. If it cost the farmer twelve and a half cents per bushel to transport his grain to navigable waters, or to market, upon a bad road, the actual expense would be diminished more than three-fourths if he could quadruple his load upon a good road; for not only would there be a saving in animal power, and other expenses, to this extent, but there would be a further saving in the wear and tear of carriages, and in delays and accidents incident to bad roads. Roads, like the objects of most other expenditure, are cheapest when well made.

The business of road making has hitherto attracted very little of the public attention. Although the construction of roads is as much an art as common trades, and as much of a science as other branches of civil engineering, where good roads are the order of the day; yet with us the superintendence of their construction and repair is entrusted to all professions—to farmers, mechanics, lawyers, &c. who seldom understand much of the art, and know nothing of the science—and who are too often guided by self-interest, or caprice, and often rather mar than mend, the work of their predecessors.

We have derived many of our improvements from Great Britain; and from no country can we draw more useful teachings, in regard to road making, than from her. For although, fifty years ago, her roads were plobably not so good as ours now are, wonderful improvements have been made in them during the intervening half century. Her turnpikes, which cover, like a net-work, the surface of her island, are constructed upon the true McAdam plan, of preserving the ea thy bed of the road always dry, by an efficient metal or stone covering, and sufficient side drains. Their parish roads are now undergoing a similar improvement. These works, which absord annually an appropriation of a million and a half pounds sterling, or more than six and a half million of dollars, give employment to the pauper population, and thus remunerate the public, in a measure, for this heavy national burden. To make our readers acquainted with some of the leading principles which govern, in the business of road-making, in Great Britain, we will state them, in a summary manner, as we find them laid down in the most recent British publications upon this subject, principally from the Farmers' Series of the Library of Useful Knowledge; promising, however, that although they apply mainly to metal covered roads, they are more or less applicable to the construction of all roads, where utility, durability and ultimate economy, are to be studied.

FOUNDATION.—Eminent men differ upon this point; the one party contending that a *pitched* foundation is necessary to make a substantial and good road; the other, that no pitching is essential. Pitching, as here used, is a foundation formed of large stones. The weight of opinion is against their use. The best foundation, the use of large stones being dispensed with, is a sub stratum kept perfectly dry by proper and effectual drainage. If one substance in road-making be harder than another, the harder substance should be upon the surface, and not at the foundation. To lay the softer upon the harder, must have the effect of sacrificing the inferior material.

DRAINAGE.—All exertion to construct or repair roads is considered unavailing until the bed of the road is freed from water, and secured against its return. Of what service can metal (stone) be when the road is immersed in water. Can it consolidate? Can it form a compact and hard substance, when water is amongst it, consuming as it were its very vitals? To correct and prevent a recurrence of the evil, substantial side ditches should be opened, so as to give a slope of one inch in 24, between the crowns of the road and bottoms. If open drains cannot be made on both sides, owing to the declivity of the surface, under drains should be constructed, with outlets, through the bed of the road to the lower side. And if springs exist in the scite of the road, their water must be concentrated, and conducted off by under drains. When a particular piece of road is observed to be continually heavy, and in a bad state, it is either caused by spring water, or is situated in a flat, from which the water cannot escape. These suggestions should not be lost to us. A principal defect in our roads, is the want of efficient drainage. Wherever water is permitted to remain, either upon the surface or substratum, in wet seasons there will be a slough, and the bed of the road will be entirely broken up.

THE SUBSTANCE OR THICKNESS OF MATERIALS.—Without a sufficient depth of consolidated materials, there will not be a resistance equal to the weight which a highway is subject to. There must be weight to resist weight. If the weight of metal forming the substance be of an imperfect quality, more will be required than when sound and clean. In proportion to the quantity of deleterious matter contained in the body (as earth, small gravel, soft stone, &c.) must the thickness be increased.—Any matter that is not of a sound nature has no power in road-making, and, therefore, the hard materials alone contained in the roads substance can be calculated upon as possessing the quality to resist weights. Experience has taught, that there can be no real security against a road giving way, taking the year through, unless twelve inches at least of good consolidated materials form the body of a road; and this upon a foundation rendered sound and dry by effectual drainage.

SORT OF MATERIALS.—Not the *hardest*, but the *toughest* stones, are the best. The first will break, the latter bend. The trappean and busaltic rocks are therefore preferred; then whinstone, dark colored granite and lime-stones.

PREPARATION AND SIZE OF MATERIALS.—The stone to be employed is first freed from dirt, and then broken so small as to pass through the inch meshes of a wire sieve. Some allow the stones to retain the size of two inches, but none larger.—The tougher the nature of the material, the smaller the size should be.

QUANTITY OF MATERIALS TO BE LAID ON AT A TIME.—When a thick coat is laid on, the destruction of the material is very great before it becomes settled or incorporated with the road. The stones will not allow each another to lie quiet, but are continually elbowing one another, and driving their neighbors to the left and right, above and below. This wears off their angular points, produces mud and dirt, and reduces the stones to an angular form, and prevents their uniting and becoming firm. If there be substance enough already on the road, it will never be right to put on more than a stone's thickness at a time. A cubic yard nicely prepared and broken, to a rod superficial, will be quite enough for a coat, and will be found to last as long as double the quantity put on unprepared and in thick layers. There is no grinding to pieces when thus applied; the angles are preserved, and the materials are out of sight and incorporated in a very little time.—Each stone becomes fixed directly, and keeps its place, thereby escaping the wear and fretting which occur when they are applied in a thick stratum. On new roads, the covering should be applied in thin coats. As soon as one is embedded, apply another, until the desired power is obtained.

"To say nothing of the saving in a course of years, by the durability of a road formed under the new system, and which has been found in some cases, even where the traffic is considerable, by the side of a large town, to last for seven years without an additional stone being applied; to say nothing of the saving to the public in wear and tear of horses, carts and tackle; to say nothing of the comfort of travelling a smooth road, and also to say nothing of employment found for the poor; yet a road can be maintained good and perfect for half the sum, under the new system, which under the old, is expended without improvement."

SPREADING.—Cause the load to be shot down a short distance from the place upon which you wish the materials to be finally spread; and direct the spreader to cast every shovel full from him equally, all over the surface, and in such a manner as he would do if he were sowing wheat broadcast. The road will then be not thicker in one place than another, and a section will be produced perfect and true.

The writer on the subject of roads, in the Farmers' Series, suggests some alterations in the British road laws, which have a particular bearing upon our condition, and seem well worthy of our consideration.—He suggests,

1. That the business of road-making and repairing should be entrusted to the authority of a county, and not of a parish; because, first, the *public* interest will govern more, and *private* interest less; and secondly, the limited extent of the funds of a parish will not admit of giving such a salary to a surveyor—an officer there deemed indispensable—*as will secure the services of a person* EDUCATED *in the principles of road management, and otherwise qualified for the*

office of surveyor—an office whose duties are here performed by path-masters.

2. That the means for maintaining roads be no longer obtained by statute labor, which is similar to our road assessments—because the law operates in this respect partially, and the time spent by the farmer in paying this tax, is worth more to him than it benefits the public. He recommends that the cartage be done by contract, by which he calculates a saving of 50 per cent. and that the manual labor be judiciously applied under the supervision of a competent engineer.

3. That the surveyor, or manager, be appointed for a longer period than one year, that he may be enabled to carry out a systematic plan of improvement, and give efficacy to his skill and science.

SCRAPING.—If it is desirable to keep a road dry at the foundation, it must be equally so at the surface.

MEMORIAL TO CONGRESS FOR THE IMPROVEMENT OF THE ALLEGANY RIVER.

To the Honorable the Senate and House of Representatives of the United States of America, in Congress assembled:

The undersigned, your memorialists, respectfully solicit the attention of your Honorable Bodies, to the subject of the improvement of the Allegany River, for steam navigation between Pittsburg, Pennsylvania, and Olean, New-York. Frequently the attention of the public and on different occasions that of Congress for the last few years, has been called to the importance of the Allegany River, as opening a direct communication from the State of New-York into the vast Valley of the Mississippi; but its claims upon the favorable action of the General Government have hitherto been neglected or overlooked. Such is the geographical position of this River for local trade—extending into the State of New-York, communicating with the Ohio, thence affording a water communication into twelve of the States of this republic—that with the feasibility of the improvement once established, every impartial mind must concede its importance. But at no period has its importance been equal to the present. By the last Legislature of New-York, a loan of three millions of dollars was granted to the New-York and Erie Railroad Company, (before incorporated with a capital of $10,000,000,) also an appropriation made for the immediate construction of the Genesee Valley Canal, from Rochester to this River, both of which improvements are in a state of rapid progress, and are to unite with the Allegany at, or in the vicinity of Olean: so that with these completed, nothing will remain but the improvement of the Allegany to effect the long desired object of an uninterrupted communication by water and railway, from the city of New-York and the other great commercial emporiums of the Atlantic border, to the country bordering upon the Ohio, the Mississippi, Missouri, and their respective tributaries.—Your momorialists would suggest that one important consideration influencing the Legislature of New-York in the construction of the aforesaid improvements, was the strong belief in the practicability of the improvement of this River, and the knowledge of its importance in reference to the trade of the Mississippi Valley. The language of the Directors of the Railroad Company in their Report, is, "that the committee for investigating the subject, became fully satisfied that in the Allegany River, the State of New-York possesses a source of internal navigation unequalled during its continuance, for cheapness, security, and expedition—that its waters gathered among its sources in Pennsylvania, become swelled by the various branches it receives within our limits, to a deep, smooth, and capacious River, flowing over a pebbled bottom, unobstructed by rocks or sand-bars, with a uniform descent from our State line, (192 miles,) to the great western emporium of Pittsburg; that the navigation of this stream remains open frequently until mid winter—that it invariably opens within the first ten days of March, and often before that time, and always remains open, and perfectly available for the purpose of descending navigation, for at least six and frequently for 10 and 12 weeks in the spring; and finally that merchandise placed on its banks, may be delivered in the ware-houses of Pittsburg, in three days from the State line, and at an expense not exceeding fifteen cents per hundred pounds. It must be apparent, (the Report continues,) how important it is to this State, and particularly to the merchants of our commercial metropolis, to have this navigation, aptly termed "the key of the Mississippi," placed within their reach.—Opening as it does into the immense basin drained by that mighty river, it will enable our own metropolis to pour through its deep safe, and rapid channel, in the early spring, the supplies for a population already exceeding three millions of souls." Of no less importance would the improvement of the Allegany be to the State of Pennsylvania, through which it chiefly passes—by opening for settlement extensive tracts of vacant lands adjacent to the River, in insuring to Pittsburg, (her manufacturing emporium,) the trade of the north eastern section of the Union, in the increased commerce upon the lines of Canal and Railroad, completed and in progress, that unite her eastern border with this River at Pittsburg, at Portsmouth, at Franklin, and at Warren; from the numerous navigable streams that reach far into the interior and flow into the Allegany, which would become the avenues of more extensive trade; and from the general wealth which would be created by an enlarged market for the mineral productions (coal, salt and iron ore,) that extensively abound in the western part of this State.

Your memorialists feel confident in the belief that the feasibility of rendering the River navigable for regular steam navigation is sufficiently established to warrant your Honorable bodies in making an immediate appropriation for its improvement.—Already various steamboats have frequently ascended the River, some to Franklin, (115 miles,) some to Warren, (180 miles,) and one to Olean a distance from Pittsburg of 250 miles, without obstruction or injury. In the different surveys made of the River by competent Engineers—as that of Judge Geddes, in the summer of 1826, under the authority of the State of Pennsylvania, again in 1828, by Edward F. Gay, Esq., also of Pennsylvania; and in the same summer by Col. Kearney, U. S. Topographical Engineer, in pursuance of a resolution of Congress—they all agree in their observations as to the general features of the River, and in the fact, that it can be rendered navigable for steamboats, at a small expense; also in the mode by which the improvement might be effected. The Allegany for a greater part of its course, flows not through a valley like most other Rivers, but through a great ravine, from one to four hundred feet below the common bed of the adjacent country. Another peculiarity of this stream is the regular succession of alternate ripples and deep pools The ripples are generally short, and the descent inconsiderable, over which the water flows with a smooth but rapid current, though not so swift but that a steam boat of light draft and ordinary power can ascend them without difficulty, as has been done repeatedly. The current in the pools is very gentle at low water, but during high water, it becomes very nearly uniform. Although the River seems to have worn for itself its present depressed bed, by cutting through various horizontal strata of rock, yet there are no rocks strictly so called in its channel, nothing but round pebbles. The ripples are composed exclusively of these, apparantly scooped out of the pools above. No River is therefore better adapted to improvement by artificial means, than the Allegany, either by a succession of low dams and locks, or by merely concentrating the channel upon the ripples, so as to give sufficient depth of water at all seasons for steamboats. It is indeed a remarkable fact, that the Allegany should pursue an even course through so mountainous a country from Olean to Pittsburg, (250 miles,) with the average descent of only about two and a half feet per mile, without one perpendicular fall, or impediment that cannot easily be removed, and would seem to indicate the design of nature that its bed should yet become the resort of extensive trade, from all parts of the Union.

Your memorialists are aware of the objections to local improvements by the General Government, but they present this subject to the consideration of your Honorable Bodies, with the fullest persuasion that it can be regarded in no other light than as a work of great national importance, and one which upon its completion, cannot fail to "promote the public welfare, and facilitate the common defence." To establish its public utility it need but be stated that the Allegany upon, improvement will become the connecting link in the great chain of communication between the Hudson and the Mississippi—the North-Eastern and South-Western States—a communication more direct, safe, and expeditious than can elsewhere be found—that all of the New-England States, the States of New-York and Pennsylvania, and all those bordering upon the Ohio, Missouri, and Mississippi, and the navigable waters communicating

with them, comprising at least twenty of the States and Territories of the Union—are directly interested, and would be extensively benefitted by this improvement.

Improve the Allegany River to Olean, and from that point a water communication is obtained of over 12,000 miles, far into the heart of the most fertile country on the globe, upon whose plain, as has been forcibly stated, "Europe might comfortably seat all of her nations." Communicating with so fertile a country, so boundless in extent, its resources now but partially developed, it would be impossible to estimate the vast amount of trade that would flow through this source into the Mississippi Valley, from all of the commercial towns upon the Atlantic border, and the return supplies that they would derive of all the necessary products of the earth, for their ever increasing population. The public utility of this improvement is then evident. That it would facilitate the common defence in time of war in the transportation of troops, clothing, supplies, and munitions of war, is equally evident. And this consideration alone is sufficient, in the opinion of your memorialists, to warrant the General Government in an appropriation for the improvement—from a proper regard to the prudent maxim: "in peace we should prepare for war;" and from the experience we obtained of the want of such a communication during our last war, in the vexatious delays and immense expense we were subjected to in the transportation of our troops, &c., from Pittsburg to the Northern frontier—which was, as has been ascertained, not less than $3,000,000.

Never perhaps has the spirit of enterprise so universally pervaded our whole country, as at the present period. States are vieing with each other in the construction of works of internal improvement, railroads, and canals are traversing the Union in every direction, by means of which the most remote portions are brought in almost immediate vicinage—a greater community of interest, by increased commerce, is thus created—sectional asperities are removed, and the general wealth of the republic vastly augmented.

Your memorialists would notice a few of these contemplated improvements which have a bearing upon the subject of the Allegany River. The New-York and Erie Railroad from the Hudson to this River, and the Genesee Valley Canal have already been noticed. The State of Massachusetts has projected a Railroad from the city of Boston to unite with the New-York improvements, by which the New-England States would come in for a participation of the advantages of the Allegany. A Railroad is in contemplation to extend from the city of Charleston, South Carolina, to Cincinnati, Ohio, which will there intersect the line of communication of which the Allegany is a part. The great Railroad from New-Orleans to Louisville, Ky., through the States of Louisiana, Mississippi, Tennessee and Kentucky, one of the most stupendous projects of the age, which is now in progress, will, upon its completion and upon the improvement of the Allegany River, in connection with the New-York and Erie Railroad, complete a chain of internal communication from the city of New-York to New-Orleans, a distance of three thousand miles, unsurpassed in extent, expedition, and magnificence, by any other of like nature in the world; and as estimated would bring these two great commercial emporiums within but one week's travel of each other. The completion of these different improvements, may be safely counted upon within a few years. It is impossible in this brief space, to enumerate the advantages that would then result to the Union at large, by the improvement of this one avenue, the facilities it would afford to general commerce, the wealth it would create, or at all estimate the vast amount of trade that would find its way through its channel. This must continue to increase with the same wonderful rapidity that has marked the developement of the resources of the plain of the Mississippi, and its unparalled augmentation in wealth and population.

Your memorialists would call the attention of your Honorable Bodies to the fact, that the country bordering upon the Allegany River, is rich in mineral products; there being in this section very numerous and extensive beds of bituminous coal, salt, and iron ore, all of which are articles of increasing demand, in the eastern section of our country, and from which their supplies would chiefly be drawn.

Such is the present abundance of our national treasury, that the small diversion of sufficient to improve the Allegany River, would not be felt, and compared with its importance in case of war alone, the expense should not be regarded as the least objection. We have the sanction of frequent precedents of appropriations for similar improvements—they are regarded by the people in a favorable light, as an unfailing source of increased wealth to every department of industry—facilitating trade, opening the sequestered portions of the country, developing their resources, and as affording the strongest ligaments to unite us together as a nation, by making the interests of the most remote sections—emphatically ONE.

The subject of the improvement of the Allegany River between Pittsburg, in the State of Pennsylvania, and Olean, in the State of New-York, is respectfully submitted with the confident hope, that the wishes of your memorialists will be granted—by a liberal appropriation for that purpose, and thereby add to the happiness and prosperity of a very large portion of your fellow citizens. And your memorialists will ever pray, &c.

From the Farmers' Register.

EXTRACTS FROM THE REPORT OF PROFESSOR DUCATEL'S SURVEY OF MARYLAND.

Geological Examination of Dorchester, Somerset, and Worcester Counties, on the Eastern Shore of Maryland.

These three counties, comprising more than one-third of the territory of Maryland, east of the Chesapeake bay, though presenting but little variety in their mineralogical and geological features, are yet not devoid of interest in these respects, while in others they offer subjects of consideration of the deepest importance to the prosperity of the State.

The most prominent geological feature in this district is a succession of sandy hillocks, in what are termed the upper portions of these counties, being a continuation of the ridge dividing the courses of the waters that empty themselves to the east into the bay of Delaware, and to the west into the Chesapeake. These hills of sand are themselves arranged in ridges, running generally north-east and south-west, diminishing in elevation towards the southern extremity of the peninsula, forming a curve on its eastern boundary, and presenting every appearance of a series of sandy beaches produced by successive retreats of an ocean. No organic remains of any kind are known to have been found within this portion of our territory, excepting a deposite of oyster shells at the head of Taylor's Creek, two miles above the fork of the Nanticoke, and ten miles below the fossiliferous deposite occurring on the north-west branch of this river, and previously referred to as the newer pliocene formation. This deposite is overlaid by soil six feet in depth. The shells contained in it are much in the same condition as those occurring in the accumulations supposed to have been made by the aboriginal inhabitants of the country; *i. e.* the valves are separated, and are not, so far as perceived, associated with any other marine shells.—They are, however, perforated and covered with *serpulæ*, as if they had lain long, after the death of their inhabitants, at the bottom of the sea. But they are at a great distance from any actual oyster beds, and are in a more advanced state of disintegration than the fossil oysters heretofore observed; whilst, on the other hand, they are covered, as aforesaid, by a thick stratum of sand, no where else remarked to overlie Indian banks.

The lower portion of the peninsula lying in Maryland, embracing Dorchester, Somerset, and Worcester, is a low level country, mostly a deposite of stiff clay, excepting on the margin of the rivers and creeks, where the country is wavy and the soil sandy. The sand hills, on the borders of the rivers, are always situated on their south or south-eastern sides, and extend but a short distance inland. In some instances they form distinct ridges or waves of sand, running in various directions; sometimes parallel with the course of the river, and when occurring at the extremity of necks, transversely, or across the points. The intervening necks, sloping gently to the south and south-east, terminate in extensive marshes, which in high tides are frequently entirely submerged. In the midst of these marshes there are occasional sand hills, or hummocks; but rarely of any great extent.

The sameness in the geological constitution of the necks of land, just referred to, is evinced in the digging of wells, from which this section of country is exclusively supplied with water for domestic purposes. At a depth of from ten to twelve feet, penetrating through the stiff clay, there is inva-

riably encountered a stratum of clean white sand, with gravel, varying from one, to two or three feet in thickness. Out of this an abundant supply of good water can be obtained; but beneath it there is always found a soft black mud, with an offensive odor, and filled with decayed vegetable matter, composed principally of a coarse grass, similar to that growing upon the present marshes. In some places this mud is reported to be of great depth. It does not appear, however, to have ever been accurately sounded; but in one instance, already alluded to in a previous report, at Cambridge, it was traversed, and is stated to have been found overlaying a fossil deposite, the shells of which are referable to the older pliocene marls.

Another remarkable feature in the geology of this country is the occurrence of a ledge of water-worn stones, composed of quartz and sandstone, constituting gravel and boulders of various sizes, from twenty to several hundred pounds in weight.—These stones were first observed between Todd's Point and at the head of Little Choptank; they were afterwards found scattered over a narrow zone of land, between Monie Creek and the Manokin.—They are said to occur at the head of Back Creek, on the south side of Manokin, and were finally again observed near the mouth of Marumsco Creek, on Pocomoke Bay. At this last mentioned spot—being a knoll of dry ground in the marshes, protruding into the bay—the beach is covered with these stones, washing out of the bank. All of them are a close grained sandstone, with small veins of quartz, the sandstone being of the character of that occurring on the Blue Ridge, different from that constituting the *white rocks* at the mouth of the Patapsco, but similar to those larger masses that are found strewed over the surface in the upper parts of the Eastern Shore of Maryland, in Cecil county. These eratic masses form, with the exception of the bog iron ore—which will be presently more particularly referred to—the only stony bodies that occur in the three Eastern Shore counties, now under examination.*

Such are the great geological features of this section of country. A more detailed account of its physical geography will now be given under separate heads, for each of the three counties embraced within it.

Dorchester County, lying between the Choptank and Nanticoke rivers, requires perhaps more than any other county on the Eastern Shore, the assistance which would necessarily be afforded by an accurate topographical survey, in adopting measures to bring into operation her natural resources. Placed between two large rivers, her facilities for sending the produce of her soil to a market are yet not great, and mostly confined to the least productive part of her territory. The central portion of the county, most susceptible of great and permanent improvement, and even at this time the most productive, is deprived of an outlet for her agricultural staples, corn and wheat; and the no less valuable source of wealth, which she possesses, in her magnificent growth of timber. The natural channels of egress through the Blackwater and Transquaking have long since failed to be available in any thing more than a limited degree, these rivers serving now rather to increase the obstacles to the navigation of the bay into which they empty. Fishing Bay, their common estuary, offers scarcely more than five feet of water, at high tides, over a deep and extensive mud flat, which it is utterly impracticable to remove. The inconvenience arising from this cause is felt by a large portion of the county, and has suggested the application to the legislature, for the opening of a canal communication between the Blackwater and the Choptank. Such a canal would but partially remedy the inconvenience, whilst a more comprehensive view of the benefit to be derived, points to the practicability of connecting the Nanticoke with the Choptank. This is believed to be entirely practicable, and the advantages to be obtained from the connection of these two rivers, by means of a canal traversing the heads of navigation of the Blackwater, Transquaking and Chicamacomico—a project to be effected at a trifling expense—are great and obvious. A communication of this kind would not only furnish an outlet for the already valuable products of the county, but could be used as a means of conveying to it those materials, such as marl, lime, &c. (of which an abundance would be thus brought within a convenient reach,) that are necessary in order to enhance the productiveness of its soil, and bring it into that state of improvement of which it is susceptible. Other advantages may be expected to accrue from the excavation of a canal in the direction just referred to; among which, not the least important would be to render it subservient to the effectual and thorough drainage of a large extent of country, at present uncultivable, and not only itself insalubrious, but the main cause of the unhealthiness of that by which it is surrounded. It would seem to be at all times a subject worthy of the attention of a government that wishes to increase the quantity of nutriment, as well as to improve the salubrity of a country, and consequently to augment its population and prosperity, to employ suitable means to effect a complete drainage of every morassy district, within its dominion, of whatever extent.—In the present case the proposed improvement forms, however, only part of a scheme of internal navigation that might, it is believed, be advantageously pursued for the benefit of a large portion of the Eastern Shore of Maryland.

In the upper part of Dorchester county, the soil is mostly a sandy loam, well adapted, with proper management, to the growth of corn, rye, and oats. The character of soil belongs more especially to those portions lying on the rivers, and extends, with very few exceptions, over a narrow slip of land on the Choptank, as far as Hill's Point, on the bay shore. The neck between the Big and Little Choptank is a low flat country, mostly composed of a stiff clay soil, covered with a plentiful growth of pine, sweet-gum, oak and dogwood, but suffering greatly from a want of convenient drainage; an evil that might be remedied, and by which thousands of acres of land, now of little value, would be reclaimed and rendered fit for cultivation. With the advantages possessed by this section of country, in her now extensive deposites of shells on the river banks, her sea-ooze, together with her proximity and easy access to the marl deposites of Talbot county, it ought to become one of the most productive and flourishing portions of the State.

The necks and islands, forming the western and south-western portions of the country, likewise present us with low and level lands and a stiff clay soil, mostly well timbered with pine, white, black, and willow oak, sweet-gum, &c. The situations on the islands are delightful and generally reputed healthy.

Meekin's Neck, on the bay shore, is marshy, and this is the case of nearly one half of Hooper's Island, the extent of which is nearly fourteen miles in length, and from one to two in breadth; such portions of the island as are arable have a productive soil. At the head of Honga river and bay, there are extensive meadows; and where the soil, also a clayey loam, is cultivated, it is said, to yield abundantly. Bishops-head Neck offers the same character of soil and physical aspect. Throughout the whole of this district the depth of wells is rarely found to exceed ten feet, penetrating the clay to sand, from which the water issues, seldom perfectly clear, and occasionally slightly brackish.

At the heads of Big and Little Blackwater Rivers there are also extensive marshes; the country is very level, low and swampy; the soil a stiff clay; timber principally oaks and sweet-gum. Between the Blackwater and Transquaking, around Buckstown, the country is more elevated, the soil lighter, with a growth of very large oaks and American poplars. The wells here are sunk to the depth of twelve feet, through clay, reaching gravel and sand.

Towards the head of the Transquaking, and between it and the Chicamacomico, the soil is a clay-loam, that would yield very good crops of grain, if properly improved. Beyond the Chicamacomico the country is more uneven, the soil lighter, sometimes sandy, the level of the country rising towards Vienna. Wherever the soil is stiff, it is covered by a heavy growth of oaks and gum.

Hurley's Neck, along the Nanticoke, south of Vienna, is a level stiff clay, well wooded, for the distance of about seven miles, after which it terminates in an extensive marsh.

No fossil deposites, similar to those occurring so abundantly north of the Choptank, have been discovered in Dorchester county, that would answer for agricultural purposes; but the large accumulations of shells found at Horn Point, at Oyster-shell Point, and other places, together with the deposite on Taylor's Creek, already referred to, might be made eminently serviceable if burnt into lime. The only mineral

* A ledge of submarine rock is said to be off Todd's Point; and another to Benoni's Point, on the Talbot side of the Choptank.

formations of any value are the deposites of bog-ore, at the heads of Transquaking and Chicamacomico, and on Reedy Creek, in the vicinity of Federalsburg. This ore is compact, heavy, free from phosphate of iron, and would probably yield from 40 to 50 per cent. of good metal. Some inclination having been manifested by an enterprising proprietor of an extensive deposite of ore, on the Chicamacomico, to work it in place, it was thought more advisable to recommend that it should be forwarded to the Baltimore market, where it would probably command from $3 to $4 a ton.

Somerset county presents, in its physical geography, as might have been expected, great features of resemblance with the county that has just been described. Its upper portions are very sandy and rolling —a succession in fact of sand hills, gently inclining to the south, and terminating in a level deposite of stiff clay—as if at one time this part of the country had been a sea beach, from which the waters have receded to a considerable distance beyond the mud flats that formed at the same period of time the shallow bottom of the ocean, and extended several miles from her shores.—But what is here supposed to have been formerly an extensive mud flat, is now a populous country, in many places well cultivated, every where very improvable, possessing a productive soil, well timbered, and intersected by numerous creeks and rivers. These form the *necks* of the county, falling by an imperceptible slope into marshes many miles in extent, with here and there a hummock, crowned with some lofty pines, or a herd of grazing cattle looming against the horizon, to relieve the monotony of the scenery. The waters of the sound, by which these marshes are limited, are not seen, unless perhaps from the top of some hummock, and are only indicated by the occasional passage of some skiff, whose white swollen sails contrast agreeably with the luxuriant dark-green growth of these grassy plains.

Without having rea on to believe that the waters of the Chesapeake bay have absolutely diminished, it is nevertheless true that the amount of dry land is increasing on the Eastern Shore of Maryl nd, by the filling up of creeks, rivers, and small bays, at the confluence of its muddy streams. The flats of Fishing Bay and Pocomoke Bay furnish us with examples of this, upon a sufficiently large scale, to produce, in no great lapse of time, very remarkable changes in the geography of this part of our territory.

That portion of the neck of land lying between the Nanticoke and the Wicomico, and contiguous to the former river, is within a narrow stripe, wavy and sandy, inclining moderately to the S. E., and terminating in marshes. The intervening country is level, with a stiff clay soil; this being the character, as must already have been perceived, of all those portions of the Eastern Shore, comprised within what are termed the necks. Generally speaking, the N. and N. W. parts of these necks, extending along the rivers and creeks, have a light soil; in the central portions, the soil is clayey, and the S. and S. E. extremities are marshy; such is the character of Hungry Neck, between the Wicomico River and Monie Creek, and the description will answer for the Manokin Neck; though in this there does not appear to be the same uniformity in the character of the clay, which varies from a white and yellow stiff clay, to a black clayey loam, equally various in its degrees of productiveness and in the kinds of crops which it can be made profitably to yield. The upper parts of this neck are covered with magnificent oaks, sweet gums, maples and beech; the lower portions support a growth of lofty pines, with an undergrowth of holly and sweet-gum, and verging upon the marshes, that extend across the neck from the Wicomico to the Manokin, the pines are small, probab y a new growth. The soil of the lands that terminate the neck—Big and Little Beele's Islands—on the north-west side, is a sandy loam, very productive in corn and sweet potatoes.

The aspect of the country between the Manokin and Annemessex, presents us with the usual almost dead level of clayey soil, covered partly with oaks, sweet gum, maple, &c., the pine predominating towards the lower end, and on approaching the marshes, the timber having been in a great measure destroyed, there remains but a scanty growth of small pines. The extensive marshes, called the Jericho marshes form the extreme end of the necks, on the borders, and in the midst of which, are some few inhabited spots, more remarkable for their great salubrity, than, as might perhaps have been supposed, for the dreariness of their situations. To become convinced that health and comfort are sometimes found where they are very little expected, it is only necessary to pay a visit to the hospitable residence of Capt. Davy, at the head of the salt marshes of Jericho.

Annemessex Neck, whose soil and appearance would require the same description as that already given of similar portions of the country, is thickly settled towards the lower end, by a hardy population of boat-builders and boatmen; the latter supporting themselves principally by the sale of oysters, clams, and terrapins. These men may be instanced as further evidences of the healthiness of the marshy districts of country upon salt water. Whatever may be the influence of these marshes at a distance, judging from the appearance alone of those who inhabit them, or constantly frequent them, they are not the seats of disease; for it would be difficult, in any other section of our country, to find a more hardy and robust set of men, than the residents on the Little Annemessex; and yet it is not to all that the praise of unexceptionable habits can be extended.

From the head of Little Annemessex, the eye looks over the broad expanse of salt marshes, reaching to the southern limits of our State—Watkin's Point being lost somewhere among them. Bounding these marshes to the north, there is a well wooded country, with a good soil and highly improvable, extending to the Pocomoke Bay and River, and comprising the district, of Rehoboth. Marumsco Neck, towards the latter district, is also well wooded, the country and level, soil generally clay loam, in some places atthe head of creeks more uneven and sandy.

Such is the account, and it will, it is believed, be found substantially correct, that may be given of the lowest portions of Somerset county. It has already been said, that the northern part of the country is sandy. It is especially so between Barren creek, and Salisbury; but from Barren creek, in the direction of Quantico, to Whitehaven, the soil passes from a sandy loam to the stiff clay bottoms, described as forming the principal soil of the necks. Along the Wicomico river, on either side, the soil is mostly sandy. On the eastern side of this river, and reaching from it towards the south, the soil varies from sandy, sandy loam to clay loam; and a northerly direction from Princess Anne to Salisbury leads successively over clay, clayey loam, sandy loam, and through a swampy district, to the sand ridges of the upper portion of the county.

The only mineral product of Somerset county is *bog-ore*, of which there is an abundant deposite, of excellent quality, at the head of Barren Creek. It has been raised in considerable quantity, and continues to be profitably extracted by Mr. Brattan, who delivers it at Baltimore for $3 the ton. A large supply of this ore might be obtained from this and other neighboring localities. It is also found at the heads of Back and Dividing Creeks; but samples examined from these places indicate an inferior quality of ore.

The mineral springs of Barren Creek deserve more attention than they have lately received. The waters have been analyzed, and were found to contain oxide of iron, soda, and magnesia, combined with muriatic acid. They belong therefore, to the class of alkaline chalybeates, are tonic and diuretic, and have been found eminently serviceable in billious disorders. The well known curative properties of the waters, the comfortable accommodations at the springs, with the obliging disposition of the proprietor, and of the tenant, Mr. Levin L. Porter, ought to furnish strong inducements, to invalids of the Eastern Shore of Maryland, to resort to them now, as they were wont to do in former times.

No fossil deposites, answering as marl, have been found in Somerset county; but a material almost as valuable occurs abundantly in various places, constituting those accumulations of oyster shells, believed to have been made on the site of ancient Indian settlements. The spots upon which these shell banks were observed, are, on the Nanticoke, at the mouth of Witipquin Creek, and at the Sandflea Landing; on the Wicomico, at Long Point, where there occurs one of the most extensive banks of the kind known, the shells therein, being deposited at the depth of from three to nine feet, extending nearly a quarter of a mile along the shore, and several hundred yards inland; on the Manokin, Maddox island and Fishing island are covered by similar accumulations; and on the Pocomoke,

another occurs at Shelltown, about two miles above the mouth of the river. Banks of the same kind are found in other places, but of a more limited extent.

The value of this material has already been stated in a preceding report, but it cannot be too strongly impressed upon the farmers of the lower counties on the Eastern Shore of Maryland. *It is the principal agricultural resource which they possess, by a proper application of which they may double the produce of their lands.* In the upper counties of the Eastern Shore, where the worth of the material is appreciated, it is made to undergo two operations: it is passed through a coarse sieve, in order to separate the black highly fertilizing mould with which the shells are associated, and the fine fragments of these; the coarse clean shells are then burnt into lime. The sifted article readily commands from three to four cents a bushel: the lime sells at from six to nine cents, according to its quality. By referring to the section "On the comparative value of shell lime and stone lime," your Excellency will perceive that the difference in value, between the two articles, for agricultural purposes, is very trifling, whilst the difference in price is considerable. Can any farmer doubt that the discovery, on the Eastern Shore, of limestone quarries even of moderate extent, and to be used solely for the conversion of the stone into lime, would be of immense benefit to the country? The equivalents of such quarries are found in the shell banks that have just been indicated. They should no longer be neglected.

Worcester county has long felt the want of some parental assistance, to enable her to bring fully into action her natural resources. She has asked for three capital improvements, of which two have been reported necessary and practicable; viz. the cleaning out of the Pocomoke river, so as to render it navigable for flat-boats, at least about fifteen miles above, where it is now available, or seventeen miles beyond Snowhill, at present the head of navigation; and a canal communication between Sinepuxent bay and the Delaware. To understand the value of these improvements, it is necessary to possess an outline of the geography of the county.

This county is bordered on the east by the Atlantic Ocean; but between this ocean and the cultivable portions of the county there is a prolonged sandy beach, varying from a few hundred yards to a quarter of a mile and upwards in breadth, and extending the whole length of the coast without a single outlet to the sea from Indian river, in Delaware, to the southern extremity of Chincoteague island in Virginia. Between this beach and the main land lies Sinepuxent bay, from one to four or five miles wide, and nearly thirty miles in length. It is a shallow sheet of water, navigable only to a short distance above South Point, at the lower end of Sinepuxent Neck. The entrance to the bay is reputed to be also very shallow. Sinepuxent Neck, about ten miles long, lies between Assateague or Trap Creek and Sinepuxent Sound, at the head of the bay. The produce of this neck, and of country on the Assateague, which, comprising the Berlin district, are amongst the most flourishing portions of the county, has thus to be sent down a long bay through a difficult entrance, to encounter finally the dangers of an ocean navigation in search of a market, whilst an easy, short, and safe transportation could be readily obtained. To effect this latter object, it has been proposed to connect Trap Creek by the St. Martin's and Indian Rivers, with the Delaware Bay, inside of Cape Henlopen. The surveys for this substantial improvement have been made, and its easy accomplishment, at a moderate expense, demonstrated.

The other improvement, solicited by Worcester county—the clearing of the Pocomoke—has likewise been found to be practicable. Viewed in connection with the canal communication just referred to, it acquires more importance than is at first sight apparent. The Pocomoke river rises in an extensive swamp, situated partly in Maryland and partly in Delaware, called the Cypress Swamp, from the profuse growth of this valuable timber, by which it is covered. The bed of the river, now obstructed by large trees, lying across it in every direction, passes through the heart of the county, dividing it into two nearly equal portions. Owing to the obstacles presented by the fallen trees into its bed, its downward navigation commences only a few miles above Snowhill, after which it is free for schooners over a distance of about twenty miles, to the mouth of the river in Pocomoke Bay, on the Chesapeake side of the county. It has been proposed to remove these impedients as far up as the use of the river is found to be impeded by this cause; and the advantages to be thence derived are shown to be considerable. It would facilitate the access to a vast body of valuable timber, and to extensive depositions of iron ore of good quality; and by confining the waters of the river within their natural channel, it would effect the drainage of a large tract of land, now an almost impenetrable swamp, covering doubtless a rich and fertile bottom. These are interesting considerations, whose importance becomes enhanced by the fact of the practicability of farther connecting, by a canal navigation, the head waters of the Pocomoke with the St. Martin River, and its projected communication with the Delaware, thus establishing a complete thoroughfare through the county, from one bay to the other.

But to render this project of internal navigation complete, another improvement seems to be required. The mud flat in Pocomoke Bay, already alluded to, forms, as is well known, a serious impediment to the free egress from the mouth of the river, through the sound into the Chesapeake, and the inquiry has been made as to the possibility of removing it. Attention having been turned to the subject, the removal was concluded to be quite impracticable, as well from its nature as from its extent; being the natural effect of causes, that, as *they* cannot be removed, would be constantly giving rise to the same results.—Whatever remedy might be partially applied would be therefore but temporary, very expensive, and would do but imperfectly, what, it is considered, can be accomplished in a more permanent, less costly, and more efficient manner, in another direction, namely: by connecting the Pocomoke with the Annemessex,—a project which has already met with the approbation of the Legislature, and for the performance of which an adequate sum of money has been contingently appropriated.

As this project was brought forward by an honorable Delegate from Somerset, it shows that this county is equally interested in it, as she is in another direction with the proposed connection of the Nanticoke with the Choptank. Viewing these projects connectedly, it will be seen that they are intended to establish an internal communication of some extent, calculated to bring into full operation all the resources of the country through which it will pass, enabling it to send its products to a market by the shortest route, and facilitating to it the means of obtaining the materials necessary for its improvement. Some advantages would likewise be derived from it in case of war, upon which the billigerent spirit of the times compels us unfortunately to calculate as a possible event, by providing against the almost total non-intercourse between one section of the State and another. It forms a part of the duties of the undersigned to report to your Excellency, that the geological constitution of the country is highly favorable to the easy accomplishment of these projects.

The agriculture of Worcester is not in so favorable a condition as it might be brought to with a little more exertion. The soil is alternately sand and clay, or a mixture of both in variable proportions, and entirely deficient in calcareous matter. On the western side of the Pocomoke, the upper portions of this district that are not swampy exhibit a succession of sandy knolls and ridges, with occasional basins, as it were, of level land, composed of stiff clay. The growth is principally pine and sweet gum: but on the branches, and in the swamps, there is seen a profusion of alder, maple, magnolia, kalmia, with the cypresses, of which two species were observed,—one deciduous, called the bald cypress, the other an evergreen. Between the Naseongo and Dividing creeks the soil varies from almost pure sand to a sandy loam, rarely, though sometimes clayey; the pine and sweet gum form the principal growth upon it. Along the margin of the river the soil is very sandy.

East of the Pocomoke the country is more swampy, the runs that feed the river being principally on this side. It is covered by a heavy growth of oak and cypress, and when cleared and drained shows a stiff clay soil. On some portions of the newly cleared land a young growth of papaw was observed, and in some places the less auspicious persimmon makes its appearance. Receding from the river the country, is gently elevated, forming a low dividing ridge between the feeders of the Pocomoke and the waters of the St. Martin river and Sinepuxent bay. This ridge-land runs north

and south, in the direction of the main road through St. Martins, Berlin, and Newark. Sinepuxent neck is a level track of land, with a soil varying from sandy to clayey loam, occasionally passing to a stiff clay. The middle portion of the neck is tolerably well wooded; the extreme end, towards South Point, has been stripped of its timber. This, the Berlin vicinity, and the St. Martin district, are amongst the most flourishing parts of the county.

From Newark to Snowhill, on approaching the river and town, the soil becomes very sandy; and proceeding southwardly, as far as Newtown, the soil passes over a succession of sand hills, barely possessed of a soil. Towards the extreme end of the connty, continuing along the Pocomoke, the country is more level, with a more substantial soil, said to yield good corn crops, and is much better wooded.

Crossing the peninsula in the direction of the dividing line between Maryland and Virginia, the country, at first level, soon appears gently undulatory, with a mixed soil, frequently a stiff clay, to within two or three miles of the sea side, when it becomes decidedly hilly; occasionally well wooded with pine, oak, hickory, and dogwood, having a good loamy soil, that could be made very productive in corn and oats. This sea side, as it is called, is an uneven country, stretching along Sinepuxent Sound descending occasionally by a gentle slope, and sometimes encroaching upon it in the shape of extended marshes. The ridgeland, between the sound and river, is more level, soil more clayey and equally improveable, but no where in a good state of cultivation.

Sinepuxent Bay or Sound, to which reference has so frequently been made, forms a very important feature in the physical geography of Worcester county. The map A. appended to this Report, and furnished for its illustration by the Topographical Engineer of the State, exhibits its actual appearance contrasted with that it bears in the maps and charts now extant. Its condition, as a navigable sheet of water, has been fully described in the "Report of the Commissioness of the States of Delaware, Maryland, and Virginia, for the survey of the sounds, between Cape Charles, and Cape Henlopen," submitted last year to the General Assembly of Maryland. For present purposes it is only necessary to consider it as a narrow and shallow sea, interspersed with broken marshes and shoals, composed of oyster shells, mixed with clam, scallop and other marine exuviæ. It is interesting in a geological respect, and not a little so, as will immediately be shown, for the agricultural resources which it actually does, and can more extensively be made to yield.

It is an interesting fact connected with the past and present condition of Sinepuxent Sound, that since the closing up of some inlets admitting the ocean into it, itswaters have become thus comparatively fresh, the oysters and clams, by which they were formerly thickly inhabited, have died, leaving extensive beds of their exuviæ. These accumulations of shells, or *oyster rocks*, as they are here termed, seem to point at the manner in which similar deposites, now far inland, and constituting the shell-marl deposites of other districts, have been made. They are evidently the quiet and gradual accumulation of years, covered by a deposition of sand or mud, varying, according to circumstances, with the altering condition of the country where they are now found, and in some measure serve to explain the mode of formation of our fossiliferous beds. At no very remote period of time, they will probably furnish the prototypes of a geological formation, hitherto undescribed and characterized by the presence of a new species of zoophytes. In their present state, these oyster rocks afford an abundant supply of a very valuable material, already put to good account, but that ought to be much more extensively employed. They are now dredged, and their contents, consisting of oyster sheils, clams and other marine shells, incrusted by a zoophytic production which has received the name of *Bunyan*, are burnt into lime. From this source not only an important and profitable branch of industry is created, but an invaluable product obtained for the improvement of the whole of Worcester county. The question has been asked, whether the lime obtained from this source is good? It may at once be answered, that it is as good as from any other quarter; but a more satisfactory reply will perhaps be found in the third section of this report. Indian shell banks also are fonnd on Sinepuxent Neck, where they have been partially applied, and always with the best results, which ought to be an encouragement to their more liberel employment.

The mineral product of Worcester county is confined to the bog-ore, occurring abundantly on the Naseongo, where it has been worked with variable success, being unfortunately too much mixed with phrosphate of iron. A deposite of ore of better quality has been discovered on the Pocomoke, in the fork between this river and Duncan's mill-branch, and it is again met with in the swamps around Newtown.

A more general view of the application that can be made of the knowledge so far acquired, respecting the physical geography of the three counties just described, remains now to be taken.

Agricultural resources of the lower counties on the Eastern Shore of Maryland.

The agricultural improvements of Dorchester, Somerset, and Worcester counties, fall far short of what they might be made to attain, by a better system of cultivation, and a more liberal employment of the resources which this section of the State possesses. But to effect a thorough improvement, the attention should be first directed to the congeniality of the soil, in each district, for that species of growth from which a crop is expected. Corn and wheat are the staple commodities of the Eastern Shore, but in the present condition of things the latter is so precarious a resource, that corn may be said to be the principal produce and main dependence of the lower counties. And yet their various soils are capable of producing a number of other crops: rye, oats, beans, potatoes, (common and sweet,) and the root crops generally. But it is not only in limiting the variety of their crops, that the agriculturists of this section of country err; they neglect to take into account the peculiar susceptibilities of the various kinds of soil, to produce certain crops in preference to others; and thus an injudicious system of husbandry is followed, resulting most frequently in disappointment. On some of the light soils described as belonging to the upper portions of these counties, wheat cannot be raised, whilst these same soils may be made to yield profitable returns of corn, rye, and oats; it is therefore worse than useless to attempt to raise wheat upon such lands. The opinion that oats exhaust the soil, is an unfounded prejudice; for any system of rotation, with proper management, appears to be beneficial. Those parts, on the other hand, that possess a clay soil, with variable proportions of sand, admit of the alternate extraction from them, of corn and wheat crops, provided they be followed up by clover, cut and turned in, with lime; or if grazed not too closely.

Another popular belief, founded upon prejudice, is, that plaster will not act upon land contiguous to salt water. It is not so. Lands, whether near or remote from the sea, upon which *gypsum* did not seem to take kindly, have been found, *after being marled or limed*, to derive the usual benefits imparted by this valuable material.

In some parts of Somerset, a small portion it is true, as yet, the crop of sweet potatoes is the main one, and is found very profitable, as is evident by the thriving condition of the small farms on Big and Little Deele's Islands; whilst intelligent farmers, in other parts of the county, have turned their attention advantageously to the cultivation of beans, peas, &c. But there is yet another growth that bids fair to become of great value to the agricultural interest of the Eastern Shore of Maryland, namely, the *palma christi*, or castor bean plant, sometimes known by the name of *mole plant*.

An attempt was made in the Report of last year, to excite the interest of the farmers of Queen Anne and Caroline counties, in behalf of this new crop. It is to be regretted that they have not extensively, if at all, availed themselves of the suggestion—the bean having increased in value far beyond the most sanguine anticipations.—There ought to be, therefore, no further delay to the introduction of this growth as one of the staple commodoties of Maryland.—Without having been as yet able to ascertain the precise cause of the extraordinary demand for this article, within a few years, there is still reason to believe that the call for it will continue to be great; since, notwithstanding its extended cultivation in consequence of the high prices obtained in preceding years, it now commands a higher price than at any former period. It has been stated that the oil expressed from the beans is employed in large quantity in the manufactories of England for greasing the machinery by which these establishments are put into operation.

The culture of the palma christi presents no difficulties. It is said to thrive best in good corn lands, yielding, according to the quality of the soil, from twenty-five to forty bushels per acre. The land requires the same preparation as for corn; and the bean is planted like this grain,—in hills on which two or three plants are suffered to grow; the subsequent tillage being also the same as that practised for corn. The most tedious part of the management of this crop is the gathering of fruit, which forms a cluster with a pyramidal termination; the lower portion being occupied by the male flowers that yield no seed, and the upper by the female flowers. In the female flowers, the ovary, which is roundish and three-sided supports three linear reddish stigmas, forked at their apex, The fruit, properly speaking, is a round capsule, with three projecting sides, covered with rough spines, and divided into three cells, each containing one seed. The flowers appear in July, and the seed ripens throughout August and September. If suffered to do so on the plant, the cupsule bursts with considerable force, projecting the seed at a distance, and scattering it about the field. To avoid this is the only extra attention required by this growth, and this is done by anticipating the maturity of the fruit. The directions are, to visit the plantation a little before the commencement of the ripening season, removing those clusters that approach to maturity, (which is known by a change of color, from grayish green to a light pea-green,) and conveying them to the drying ground, where, by the effect of the sun's heat, they burst, and dislodge their seeds. The only preparation for the drying ground is to provide a small place, cleaned and levelled as for a thrashing floor, upon which the clusters are scattered. It would be advisable to locate this spot in the neighborhood of the barn, or near a shed, so as to facilitate the removal of the plants, in case of protracted wet weather, to some sheltered situation. Transient showers of rain do not, however, damage it, otherwise than by blackening the seed, whereby its sale might be injured, although it does not diminish its productiveness in oil. The occupation of gathering having once commenced, it should be so arranged as to visit each plant twice a week, morning and evening, until the whole crop has been secured. It may then be sent to a market, where, at the time of writing this Report, it commands three dollars a bushel; or, it may be made to yield its oil by the following process, as practised in Northampton county, Virginia.

The seeds are first to be thoroughly cleaned of dust, and of portions of the capsules that may have adhered to them. They are then introduced into shallow iron drawers, arranged on both sides of a furnace, where they are exposed to a gentle heat; the object of this first operation being to render the oil more easy of expression.—From these drawers they are conveyed into a powerful screw-press, by the operation of which the oil is obtained. So far however, the oil is impure: It must now, therefore, be transferred to clean iron boilers, previously supplied with water. As the boiling proceeds, the impurities that rise to the surface are skimmed off, and the clear purified oil finally makes its appearance, floating on the water. It is now carefully removed, and a sacond time subjected to the boiling process, with a small quantity of water, until the latter liquid has been entirely dissipated. This is ascertained by taking out a small portion into a vial, and observing whether it preserves its transparency as it cools. Some care is required not to push the heat too far, as then the oil would acquire a brownish hue and a hot peppery taste, which would at all events unfit it for use as a medicine. One bushel of seeds yields about one gallon and three-quarters of oil, at an expense of about 25 cents a bushel, which is refunded by the sale of the *pumice*, found to be excellent manure for corn crops. Acknowledgments are due to Mr. Smith, of Northampton county, Va., an intelligent and experienced planter, of palma christi, and manufacturer of castor oil, in the vicinity of Eastville, for the information contained in the above paragraphs.

It is needless, after what has just been said, to expatiate upon the value of the plant. That the soil and climate of at least the lower portions of the Eastern Shore of Maryland are congenial to its growth, cannot be doubted. The praiseworthy example (crowned, it is believed, with entire success) has already been set to the inhabitants of Somerset, by one of the most intelligent farmers of the county—Col. Arnold E. Jones.

Persons well acquainted with the cultivation of rice confidently assert and believe, that there are many spots on the Eastern Shore of Maryland, well calculated to the production of this important agricultural commodity. Rice has been rsised in Maryland, in the vicinity of Salisbury, at the head of the Wicomico, and a promising attempt, the result of which has not been ascertained was recently being made opposite Vienna, on the Nanticoke. It would seem desirable to encourage such attempts, as further conducive to the practical illustration of the possibility of reclaiming a vast body of lands at present of little value. These are the marshes and cripples that occur on the margin of the large rivers on the Eastern Shore of Maryland. An examination of the actual condition of these marshes justifies the belief that they might, to a certain extent, be drained; whether sufficiently to be made permanently arable, or only to the extent of serving as more firm and sale pasturages, remains to be tried. It is thought that the single operation, though one not unattended with difficulties, of diverting a part of the course of the river so as to cause it to pass between the marsh and the mainland, would greatly contribute to their drainage. This appears from the fact, that their most elevated parts are those contiguous to the river, inclining moderately towards the firm land, adjoining which the marsh is always found to be the softest, and more liable to a total submersion. By insulating these bodies of land, always more or less miry, and thus establishing a drainage around them, it is possible they might eventually acquire sufficient consistence, without having recourse to embankments, to afford safe and valuable pasture grounds. The cripples seem irreclaimable by any other means than by embankments,—an operation deemed practicable by those who have given much attention to the subject, and who represents them as best fitted for the cultivation of rice.

Such are the agricultural resources of the lower counties on the Eastern Shore of Maryland, so far as the productiveness of the soil, and its susceptibility of improvement are concerned. It has already been stated, that the only incidental resource possessed by this section of country, is to be derived from the facilities of obtaining calcareous matter (in which the soil is essentially deficient) from the shell banks, oyster banks, and other sources already referred to. But before any hope can be indulged, that the inhabitants of this portion of the State will avail themselves of these means of bringing their lands into a higher state of cultivation than they seem to have any idea that they are capable of, it is necessary to remove a fatal impression, too generally made, that the lime derived from shells is of but little value. The result of the inquiries made to disprove this opinion, will be given in the next section of this Report.

An error equally fatal prevails among the citizens of Maryland, in reference to the counties that have just been passed in review—that they are as devoid of the interest as they have been believed to be of resources. It is hoped that the minute, and at the same time, faithful account given of them—more minute than would otherwise have seemed necessary, will have a tendency to rectify the false judgment so commonly passed upon this portion of our territory, and contribute likewise to cheer those of its inhabitants who have become disheartened at the present aspect of things, and who are too prone to believe that their industry could be better rewarded at a distance.—Industry meets with its just reward every where; but the assertion is safely ventured, that the same amount of enterprise at home, would secure more comfort and happiness, than, under any circumstances, can be expected in a newly settled country, where all that is obtained is at the cost of solid enjoyments. The adventurous merchant and speculator may find a wide field in the "Far West" to satiate, if possible, his thirst for wealth; but the industrious farmer, on the tide waters of the Chesapeake needs no better patrimony than that which he already possesses. A soil easily cultivated, and very improveable, having the means of improvement at hand; the necessaries, and even luxuries of life in abundance; a temperate and healthful climate; a free and constant intercourse with a large commercial emporium, by means of a water communication reaching to the very door of his granaries; surrounded moreover by intelligent neighbors, and a peaceful and orderly population—such are the advantages of which he can boast, as a set-

off against those of any other section of our country. It is full time that he should learn to appreciate them himself.

PRINCIPLES OF VEGETATION.

As every thing which appertains to the production of so important a staple as wheat, must always be of profound concern to the farming interests, we insert the following from a British paper, under the confident belief, that it will elicit attention from every enlightened mind engaged in the pursuits of husbandry. The principles assumed, and facts set forth, will be novel to many of our readers, and will, we hope, set on foot a spirit of inquiry calculated to promote the great interest whose province it is to provide the staff of life for home and foreign consumption.

Principles of Vegetation—Wheat.—At the British Association in Bristol, Mr. O. Webb Hall read a communication "On the Acceleration of the Growth of Wheat." He called the attention of the meeting to a statement of facts by which it would be seen that the usual period allotted to the occupation of the ground for a crop of wheat might be very materially abridged. At an average, this might be estimated at 10 months, though 12 and even 13, were not unusual, and 8 might be considered as the shortest period for the ordinary winter wheat. By a selection of particular seed, and a choice of peculiar situation, wheat sown early in March, has been, on different occasions, ripened before the middle of August, a period scarcely exceeding 5 months. Mr. Hall considers it an unquestionable law of vegetation, that the offspring of a plant of early maturity seeks to become so likewise, even when placed in unpropitious circumstances, and that it recedes with reluctance from the condition of its parent. Hence the seed of a crop which has been ripened in 5 months, has a better prospect of producing another crop equally accelerated than that from a crop which has been longer in ripening. He also asserted, that the acceleration of a crop was farther promoted by thick sowing, which likewise might be considered advantageous in checking and stopping the mildew.

Dr. Richardson referred to the remark of Humbolt, that in South America the wheat crop was ripened in ninety days from the period of sowing, and stated, that about Hudson's Bay, this period was only seventy days. He suggested the probable advantages that might arise from importing seed from the latter country for the purpose of furthering Mr. Hall's views; but this gentleman stated, that he had found that seed imported from a distance, (and he had tried some from Italy,) was liable to become diseased. As connected with the subject of the acceleration of the growth of seeds, Professor Henslow mentioned results of experiments which he had tried upon seeds of a species of Acacia, sent by Sir John Herschell, from the Cape of Good Hope, with directions that they should be steeped in boiling water before they were sown. Some of these were kept at the boiling temperature of 3, 7 and 15 minutes respectively, and had yet germinated very readily in the open border; whilst those which had not been steeped did not vegetate. It was suggested that these facts might lead to beneficial results, by showing agriculturists that they may possibly be able to steep various seeds, in water sufficiently heated to destroy certain fungi or insects known to be destructive to them, without injuring the vital principle in the seed itself. Mr. Hope mentioned a practice common in some parts of Spain, of baking corn to a certain extent, by exposing it to a temperature of 150° or upwards, for the purpose of destroying an insect by which it was liable to be attacked. Dr. Richardson mentioned that the seeds sold in China for the European market, were previously boiled for the purpose of destroying their vitality, as the jealousy of that people made them anxious to prevent their exportation in a state fitted for germination. Upon sowing these seeds he had, nevertheless, observed that some few of them were still capable of vegetating.

EXTRACTS FROM AN ACCOUNT OF A VISIT TO ICELAND, BY M. EUGENE ROBERT.—The siliceous concretions formed by the geysers of Iceland, cover an extent of four leagues in length, throughout which there are numerous traces of the ancient geysers. We have hence been enabled to observe this singular formation under all its different forms; passing by insensible shades from that of a loose and friable character, the result of a rapid deposition, to the most compact and transparent. We have not only observed impressions of the leaves of the birchtree, of Equi-eta and various grasses, but the trunks of the birch are in many places distinctly recognizable, presenting much the appearance of ordinary agatized woods. At the present time none of these plants occur on the island, and we may suppose it probable that their destruction was the result of the invasion of the silica.

The numerous thermal springs, in the midst of which the geysers are situated, occupy large vallies in the interior of the island. Appearances indicate that these waters proceed from deep crevices, in which they have been heated by contact with the volcanic fires. The geysers present the most magnificent exhibition during an inundation of the valley by rain. The rivers proceeding from these springs have often the color of milk, owing to the argillaceous bole which they take up in their passage over the siliceous deposites. Such are the white rivers of Olafsai.

Mt. Hecla, like all the heights of Iceland, is entirely covered with snow. No smoke appeared about its summit. Obsidian occurs in rolled masses on its sides, and pumice stone forms a bed thirty feet in thickness near its base. Fragments of the branches of the birch, the remains of the once flourishing forests of the island, are found in the midst of this bed.

After traversing currents of lava of considerable extent, we arrived at the sulphur beds, or solfataras of Krisark. It is literally a mountain of sulphur, and is undergoing continual increase.—[Bulletin de la Soc. Geol. de France. T. vii. F. 1—2. Paris, 1835 a 1836.]

CIRCULAR.

PHILADELPHIA, November, 1836.

SIR—I take the liberty of informing you, that, within a few months past, I have perfected several very valuable improvements in the Locomotive Steam Engine, which have given better results than have ever been obtained by the best Locomotives in Europe or America, and respectfully call your attention to the following extracts, viz.:

From the Railroad Journal, New-York, July 16, 1836.

"LOCOMOTIVE ENGINES ON INCLINED PLANES.—The Locomotive Steam Engine, 'GEORGE WASHINGTON,' made for the State of Pennsylvania, by William Norris, of Philadelphia, was placed on the Columbia and Philadelphia Railroad, on Saturday afternoon, the 9th instant. On the following morning, her powers were tested, in ascending the Inclined Plane near Philadelphia. This plane is 2800 feet in length, with an ascent in that distance of 196 feet, or at the rate of 369 feet to the mile, or 7 feet rise in 100 feet, or 1 foot in 14. The weight of the Engine is 14,930 lbs. only. The load attached weighed 19,200 lbs. including the weight of 24 persons who were on the Tender and Burthen Car. The Engine started immediately at the base, without a running start, and dragged up said load of 19,200 lbs. the above distance of 2800 feet, in the space of two minutes and one second, or at the rate of 15½ miles per hour; pressure on the boiler a fraction under 60 lbs. to the square inch. The Engine then descended the plane with the same load at various speed, frequently stopping to test the security, the valves being reversed, or set for going ahead; and when it was desired to stop altogether, the steam was let on very slowly, which brought her to a dead stand for a second or two, when she would immediately start up the grade. In this way, stopping and starting at pleasure, the time occupied in descending the 2800 feet, was from 12 to 15 minutes, thus testing the perfect security of her performance on the plane. She again ascended the plane with the same load and took her place on the road, the same morning, ready for use."

From the Pennsylvania Inquirer, July 21.

"IMPORTANT IMPROVEMENT.—THE GEORGE WASHINGTON LOCOMOTIVE.—We invite attention to the following. It notices an improvement of a most important character. A friend, who enjoyed the pleasure of an excursion in a car drawn by this new locomotive, speaks of her beauty and power in the most enthusiastic terms. We trust that some correspondent, acquainted with the subject, who has had an opportunity of examining the GEORGE WASHINGTON, will furnish a detailed account of this new and important improvement.

"FROM THE UNITED STATES GAZETTE.—'Mr. Chandler—The undesigned was yesterday one of a party of about fifty gentlemen, who met at the invitation of Mr. William Norris, to be witnesses to the success of an experiment, which, as the consequences will be of almost incalculable benefit to the public in general, I will endeavor to give you an account of.

"'We assembled at 4 o'clock, A. M., and proceeded to the foot of the inclined plane on the Columbia Railroad, near the Schuylkill, where we found Mr. Norris's new Locomotive Engine, the 'GEORGE WASHINGTON,' in waiting for us, to test her powers in taking us up the plane without assistance from the stationary power.

"'We started, ascending most majestically the whole distance of 935 yards in 2 minutes and 23 seconds, being at the rate of a mile in 4¼ minutes, thereby showing to the world that, thanks to Mr. Norris, the enormous expense of stationary engines on Railroads was no longer necessary.

"'We were unable to ascertain the exact weight of two of the passenger cars, but estimating three tons each, would make our whole weight fourteen tons, and that calculation is believed to be below the mark; the rise in the plane is 7 feet in every 100 feet, or 1 foot in 14⅔ feet; and the greatest power that has ever been before attained, was, in England, to ascend without any extra weight, 1 foot in 60 feet, and in America, 1 foot in 42 feet. Very little reflection will convince every one of the great importance of Mr. Norris's recent discovery or improvement.

"'The company, amongst whom were several gentlemen of distinguiseed talents, Messrs. Campbell and Roberts, engineers, Mr. Ortlip, superintendent, Mr. Smith, commissioner, Messrs. Minor and Schaeffer, from New-York, Mr. Schwartz, from Paris, &c. &c., breakfasted at the Paoli, and proceeded to Lancaster to dine and celebrate the event.

"'After dinner, it being understood that his Excellency, Governor Ritner, was in the town of Lancaster, and his engagements not allowing of coming all the way to Philadelphia, he accepted an invitation from Mr. Norris, to take a short excursion on the road, for the purpose of seeing the powers of the engine; and judging by his manner and expressions, his gratification must have been more than ordinary.

"'We returned to the city about 8 o'clock in the evening, convinced of the success of our host, Mr. Norris, and having, in the language of one of our party, lived six days in one.'"

From the National Gazette, July 21.

"On Tuesday, the 19th instant, a Locomotive Engine, manufactured by Mr. William Norris, of this city, ascended the Inclined Plane on the Columbia Railroad, drawing with great ease her Tender, and two Passenger Cars, with 53 passengers. Any thing approaching this result has never been attained hitherto, either in England or this country.

"The length of the plane is 2800 feet, the grade 369 feet to the mile, or an ascent of 196 feet in the length of the plane.—The experiment was tried at a very early hour in the morning, while the rails were wet with dew, and of course not in the most favorable condition. The time occupied in passing from the level at the base, to that at the top of the plane, was 2 minutes and 24 seconds. The experiment was witnessed by many scientific gentlemen, among whom the opinion was general, that the improvement of Mr. Norris promises a most important reduction in the expense hitherto attending the transportation on inclined planes. The weight of the Engine with water, 14,930 lbs.; load dragged on the plane, including tender and fuel, cars and passengers, 31,270 lbs. Pressure under 80 lbs. to square inch. It is remarkable that the Engine was blowing off, on her arrival at the top, having acquired speed and power during the ascent."

From the Railroad Journal, New-York, July 30.

"EXCURSION TO PHILADELPHIA, AND REMARKABLE PERFORMANCE OF THE LOCOMOTIVE 'GEORGE WASHINGTON.'—In pursuance of our request, Mr. Norris made arrangements with the commissioners of the Columbia Railroad, for the use of his locomotive. Tuesday, July the 19th, was the day appointed for the trial. We left here on Monday afternoon, at 4 o'clock, accompanied by Mr. George N. Miner, of this city, Mr. Theodore Schwartz, of Paris, and Messrs. Elliot and Betts, of Alabama. Mr. Schwartz, who was to sail for Europe the next day, gladly made the trip, with a view to carry home his own testimony as an eye witness. Our journey over the Camden and Amboy, and Trenton and Philadelphia Railroads was highly interesting, and the conversation of that evening will long be remembered with pleasure. We arrived at Philadelphia about midnight and after sundry mistakes and mischances succeeded in obtaining some repose. On Tuesday morning, two cars, drawn by horses, set out with a party of upwards of forty. We arrived at the foot of the inclined plane before 6 o'clock, while the rails were yet quite wet with dew. On our arrival, it was found that, owing to accident or design, while the fire was burning, the water had been blown out of the boiler so as to endanger the tubes. The result was a leakage of some consequence during the day. The Engine started at the foot of the plane and on the plane. After proceeding a few feet, the wheels were found to slip, and the Engine returned. It was said that the rails were found to have been *oiled* at this place; a small quantity of sand was strown over the spot, and the Engine again proceeded. She regularly and steadily gained speed as she advanced to the very top, passing over the plane in 2 minutes and 24 seconds. The enthusiasm of feeling manifested cannot be described; so complete a triumph had never been obtained; the doubts that had been entertained by some, and the fears of others, were dispelled in an instant; the eager look that settled upon every one's face, gave way to that of confident success, while all present expressed their gratification in loud and repeated cheers.

"The length of the plane is 2800 feet; the grade 369 feet to the mile, or 1 foot rise in 14.3 feet, which is a much steeper grade than the planes on the Mohawk and Hudson Railroad, those being 1 foot in 18 feet, making an ascent of 196 feet in 2800 feet; weight of Engine with water, 14,930 lbs.; load drawn up the plane, including weight of Tender with water and coal, two Passenger Cars and 53 passengers, 31,270 lbs.; pressure in the boiler, less than 80 lbs. to the square inch; time of running 2 minutes and 24 seconds. It is to be remembered that the rails were wet with dew. As to the oil, it was afterwards mentioned that bets were made with the workmen to a considerable amount, and those having been lost by the successful performance of the Engine on a former day, were now quadrupled, and to save themselves it is not unlikely that this means was provided to accelerate the descent rather than the ascent of the Engine. At the conclusion we shall give the dimensions of this Engine.

"The party again embarked, after examining the workshops, and proceeded to Paoli to breakfast, and thence to Lancaster, the Engine conveying at the same time a number of freight cars.

"The unfortunate location of this road is very evident; frequent and short curves are introduced so uniformly, that it would be supposed that such a location was to be preferred to a direct one. We arrived safely at Lancaster, and partook of an excellent dinner. A number of toasts were given, and conversation turned generally to the subject of internal improvement.—Mr. Roberts, engineer of the Harrisburg road, and Mr. H. R. Campbell, engineer of the Norristown, and of the West Philadelphia Railroad, were present; a number of the company were citizens of Philadelphia. After dinner, the company were presented to Governor Ritner, who was then in town. He afterwards accompanied the party some few miles from Lancaster and back again, when he left us, much gratified with his rapid journey. We returned in a large eight wheel car, a form that we much admired. The whole weight attached to the Engine (tender, &c. included,) must have been over 14 tons, if not 15 tons. The time of running (exclusive of stoppage,) from Lancaster to the head of the Schuylkill inclined plane, was 3 hours and 11 minutes, being a distance of nearly 67 miles. This, it is to be remembered, was over a road having curvatures of less than 600 feet radius, up ascents of sometimes 45 feet per mile. On level and straight portions of the road, a velocity of 47 miles was attained. As the trip had already been protracted, this engine was obliged to leave at the head of the plane, on her return to Lancaster the same evening, and we descended by the rope.

"The following are the dimensions of the 'GEORGE WASHINGTON' Engine, of Mr. William Norris: Diameter of cylinders 10¼ inches; length of stroke 17⅝ inches; number of tubes 78; outside diameter 2 inches; length 7 feet; diameter of driving wheels 4 feet; diameter of truck 30 inches. The Engine is six wheeled, having two driving wheels. Whole weight of Engine 14,930 lbs., actual weight on driving wheels 8700 lbs.

"It must be rembembered that there is no contrivance, as in some engines, for increasing the adhesion, by throwing the weight of the tender upon the engines, the axle being in front of the fire box, preventing any such arrangement. This engine,

we are now informed, is making the regular trips, though a full load has not yet been obtained, on account of the scarcity of cars. The greatest load, as yet, drawn by it over the road, was 119 tons, gross weight, in 22 cars. The engineer confidently expects to draw 150 tons, at 12 or 15 miles per hour. She now usually works with 70 lbs. pressure of steam.

"The following is a list of the names of the gentlemen who were of the party:

"We, the subscribers, were present and witnessed the experiment and complete success of the 'GEORGE WASHINGTON,' in ascending the inclined plane, with a train of cars, containing 54 persons, besides engineers, firemen, &c., up the Columbia Railroad, at Philadelphia, on the 19th July. 1836.

Israel Morris,	Israel Roberts,
William Morrison,	S. Griffits Fisher,
A. M. Eastwick,	Joseph Harrison, Jun.
Franklin Peale,	R. M. Patterson,
T. E. Gubert,	Theodore Schwartz,
F. Blackburne,	E. Durand,
George R. Oat,	Townsend Smith,
Isaac P. Morris,	Frederick Vogel,
George Robbins,	Rufus Tyler,
A. W. Thompson,	Robert B. Davidson,
Frederick Gaul,	Alex'r. Krumbhaar,
William S. Otis,	D. K. Minor,
Alexander M'Clurg,	T. R. Peale,
P.B.Goddard,M.D.,	Octavius A. Norris,
J. Sidney Jones,	Joseph Oat,
Mahlon Ortlip,	James Poultney,
J. C. Cresson,	John E. Garrett,
George N. Miner,	George C. Schaeffer,
M. M. Reeve, M.D.,	H. R. Campbell,
Smith Jenkins,	Daniel Smith,

Thomas Moore,
Walter Sims, Nashville, Tenn."

From the National Gazette, October 19.

"INCLINED PLANES.—The new Locomotive Steam Engine, 'WASHINGTON COUNTY FARMER,' built for the Commonwealth of Pennsylvania, by Mr. Norris, of this city, was placed on the Columbia Railroad, on Tuesday afternoon.

"The power of the Engine was then tested in ascending the Inclined Plane, which was performed to the complete satisfaction of numerous scientific gentlemen, invited expressly for the occasion.

"The plane is 2800 feet long, ascent in that distance 196 feet, equal to 369 feet to the mile, or 1 foot rise in 14 $\frac{3}{10}$ feet. Weight of Engine 18,170 lbs. with water included. Load drawn up, 30,116 lbs. including Tender with fuel and water, two large Passenger Cars and 39 passengers. Time of running, 3 minutes and 15 seconds, pressure in the boiler under 70 lbs.

"In descending the plane, the engineer repeatedly came to a dead stand from a great speed, and for some minutes played up and down the grade, thus proving most satisfactorily, the immeuse power of the Engine, and the perfect safety in its performance. The Engine is a master-piece of machinery and of beautiful exterior.

"The result here obtained has never been equalled by the best Engines in this country or Europe, excepting only similar performances of the 'GEORGE WASHINGTON,' an Engine by the same maker.

"The advantage of this great improvement in Locomotive Engines, is self-evident; Railroads can be constructed at much less cost than heretofore, now that engines can be procured (of the usual weight) to perform on grades of 70 feet or even 100 feet rise in the mile."

From the Pennsylvania Inquirer, October 20.

"INCLINED PLANES—MR. NORRIS'S ENGINE.—We were much gratified on Tuesday, in witnessing the new Locomotive Steam Engine, built by Mr. Norris, of this city, for the commonwealth of Pennsylvania. It ascended the Inclined Plane in admirable style, and performed, to the entire satisfaction of a numerous party of scientific and other gentlemen who were present.

"In order that our readers may fully understand the nature of the ascent, we annex the following statistics of the Inclined Plane: length, 2800 feet; ascent, 196 feet.

"The above ascent is equal to 369 feet in a mile, and is a rise of 1 foot in 14 $\frac{3}{10}$ feet.

"The Engine, which is called the 'WASHINGTON COUNTY FARMER,' weighs 18,170 lbs. The load drawn up, including fuel and water, two large Passenger Cars, with 29 passengers, weighed 30,116 pounds. The pressure in the boiler was under 70 lbs., and the ascent occupied 3 minutes and 15 seconds.

"In descending the plane, the engineer caused the Engine to stop suddenly several times, though previously going at great speed; and he twice moved the Engine up and down the Inclined Plane at pleasure; thus showing at once its great power and safety."

The "GEORGE WASHINGTON" has been, since July 19th, performing daily over the Columbia Railroad, length 82 miles, with trains of from 18 to 25 cars, frequently making two trips per day, and in some instances three trips in 21 hours. The largest number of Cars, in one train, drawn by this Engine over the road, has been 35; 18 loaded, 3 half loaded, and 14 empty, making a load of 128 tons, which was performed in the usual running time of 12 miles per hour. The greatest load drawn by this Engine, has been 137 tons, in 27 cars.

The "WASHINGTON COUNTY FARMER" is now in successful operation; the first load drawn by her over the road, consisted of 28 loaded cars, weighing 141¾ tons.—The ascents in this road are very heavy; the least being 28 feet rise per mile, the majority 32 feet and the greatest 47 feet. This Engine, with the load of 141¾ tons, passed over the steep ascent of 47 feet per mile, which is upwards of three-fourths of a mile long, at the unprecedented rate of 22 *miles* per hour.

I have just completed extensive buildings and workshops, and am prepared to execute orders for Locomotive Engines, with despatch, all of which shall have my late improvements, and are warranted to be made of the best materials and superior workmanship.

WILLIAM NORRIS, *Philadelphia.*

NOTICE TO CONTRACTORS.

LA GRANGE AND MEMPHIS RAILROAD.

PROPOSALS will be received at the office of the La Grange and Memphis Railroad Company, in the town of La Grange until the 24th of December next, for the grubbing, clearing and construction of all the excavations and embankments of said road, being fifty-two miles in length, together with a lateral branch from Moscow to Sommerville, of thirteen miles.

And also, to furnish and deliver along the line, all the requisite timber for the superstructure of the road, and the construction of the bridges—and also to lay down, and construct the same. The timber proposed may be cedar, or white oak and post oak. The dimensions and quantity that will be required per mile, will be as follows:

MUD OR FOUNDATION SILLS.—To be not less than fifteen feet long, three inches by nine inches, if of sawed timber, or if in logs, to have one side hewn smooth and straight, eight inches wide, and four inches thick, clear of sap—10,560 feet lineal per mile.

CROSS TIES.—To be each eight feet long, hewn on one side with a smooth and straight surface, six inches wide, and to square six inches in their entire length, free of sap—1,760 pieces per mile.

STRING PIECES.—To be not less than fifteen feet long each five inches by seven inches, clear of sap—10,560 feet lineal per mile.

General plans and specifications of all the work and special plans of the most important bridges, &c. will be exhibited at the above place, for ten days previous to the letting, and all other information will be given on application to the subscriber, or any of the assistant engineers on the line.

The usual certificates of character and ability will be expected in all cases from persons unknown

CHARLES POTTS, Chief Engineer
La Grange and Memphis Railroad.

La Grange, Tenn. Nov. 10.

P. S. For the information of persons at a distance I would state, that the above road is located on a high and dry ridge, which is considered remarkably healthy, and that the mildnesss of the climate is peculiarly favorable for operations in the open air throughout the winter.

The editors of the Railroad Journal, New-York; the United States Gazette, Philadelphia; the Richmond Enquirer, Virginia; Raleigh Star, North-Carolina; Banner, Nashvile; Enquirer and Gazette, Memphis, and the North Alabamian, will please to insert the above three times each, and forward their accounts as above for settlement. 3t48

HARVEY'S PATENT RAILROAD SPIKES.

THE Subscribers are manufacturing and are now prepared to make contracts for the supply of the above article. Samples may be seen and obtained at Messrs. BOORMAN, JOHNSON, AYRES & Co. No. 112 Greenwich Street, New-York, or at the Makers in Poughkeepsie, who refer to the subjoined certificates in relation to the article.

HARVEY KNIGHT.

POUGHKEEPSIE, October 25th, 1836.

The undersigned having attentively examined HARVEY'S PATENT FLANCHED and GROOVED SPIKES is of the opinion, that they are decidedly preferable for Railroads to any other Spikes with which he is acquainted; and shall unhesitatingly recommend their adoption by the different Railroad Companies whose works he has in charge.

BENJ. WRIGHT,
Chief Engineer N. Y. & E. R. R.

NEW-YORK, April 4th, 1836.

Harvey's Flanched and Grooved Spikes are evidently superior for Railroads to those in common use, and I shall recommend their adoption on the roads under my charge if their increased cost over the latter is not greater than some twenty per cent.

JNO. M. FESSENDON, Engineer.

BOSTON, April 26th, 1836. No. 44—7t.

AN ELEGANT STEAM ENGINE AND BOILERS, FOR SALE.

THE Steam Engine and Boilers, belonging to the STEAMBOAT HELEN, and now in the Novelty yard, N. Y. Consisting of one Horizontal high pressure Engine, (but may be made to condense with little additional expense) 36 inches diameter, 10 feet stroke, with latest improved Piston Valves, and Metalic packing throughout.

Also, four Tubular Boilers, constructed on the English Locomotive plan, containing a fire surface of over 600 feet in each, or 2500 feet in all—will be sold cheap. All communications addressed (post paid) to the subscriber, will meet with due attention.

HENRY BURDEN.

Troy Iron Works, Nov. 15, 1836. 47—tf

A SPLENDID OPPORTUNITY TO MAKE A FORTUNE.

THE Subscriber having obtained Letters Patent, from the Government of France, granting him the exclusive privilege of manufacturing Horse Shoes, by his newly invented machines, now offers the same for sale on terms which cannot fail to make an independent fortune to any enterprising gentlemen wishing to embark in the same.

The machines are in constant operation at the Troy Iron and Nail Factory, and all that is necessary to satisfy the most incredulous, that it is the most VALUABLE PATENT, ever obtained, either in this or any other country, is to witness the operation which is open for inspection to all during working hours. All letters addressed to the subscriber (post paid) will receive due attention.

Troy Iron Works, HENRY BURDEN.

N. B. Horse Shoes of all sizes will be kept constantly for sale by the principal Iron and Hard-ware Merchants, in the United States, at a small advance above the price of Horse Shoe Iron in Bar. All persons selling the same, are AUTHORISED TO WARRANT EVERY SHOE, made from the BEST REFINED IRON, and any failing to render THE MOST PERFECT SATISFACTION, both as regards workmanship and quality of Iron, will be received back, and the price of the same refunded. H. BURDEN. 47—tf

TO CONTRACTORS.

ENGINEER DEPARTMENT, BALTIMORE AND SUSQUEHANNA R. R. COMPANY, Baltimore, Nov. 22d, 1836.—Proposals will be received at this office until the 20th December next, for laying the Rails on 56 miles of road from Baltimore to York, and twelve miles of the Wrightsville and York Railroad.

The work to be commenced on the 1st of April next. Notice is thus early given to enable the Contractors to make the necessary arrangements.

For further information apply at this office during the week previous to the 20th December.

ISAAC TRIMBLE, Civil Engineer.
47

RAILWAY IRON, LOCOMOTIVES, &c

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

						lbs.	
350 tons	2½	by	½,	15 ft in length, weighing		4 $\frac{68}{100}$	per ft.
280 "	2	"	½,	"	"	3 $\frac{50}{100}$	"
70 "	1¼	"	½,	"	"	2½	"
80 "	1¼	"	¾,	"	"	1 $\frac{25}{100}$	"
90 "	1	"	¾,	"	"	¾	"

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2¼, 2¾ 3, 3¼, 3¼, 3¼, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

Mr. Solomon W. Roberts, a highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us

A. & G. RALSTON.
28-tf Philadelphia, No. 4, South Front st.

TO CONTRACTORS.

PROPOSALS will be received from the 1st to 10th January, 1837, for the graduation of the 2d and 3d Divisions of the Long Island Railroad, comprising a distance of 20 miles beyond Jericho.

The line will be ready for inspection on the 1st of January, when plans and profiles of the routes may be seen at the Engineers Office, Jamaica.

WM. GIBBS McNEILL, Eng.
JAMES P. KIRKWOOD, Res. Eng.
Jamaica, Dec. 6, 1836. 2t*

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.
Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J.I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Durpee, Coleman & Co., for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S Durfee & Co., will be done by the new firm. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

8th month, 8th, 1836. Hudson, Columbia County. State of New-York.

E. S. TOWNSEND, GEORGE COLEMAN,
ROBT. C. FOLGER, SYDNEY S. DURFEE
33—tf.

AN ENGINEER, regularly bred to the Profession in England, as well as to that of a Topographical Surveyor and Draughtsman, is desirous of obtaining employment in the United States. He has lately, for several years, been a salaried officer of one of the Principal Land Companies in the British Provinces, from the agents of which he can produce unexceptionable references.

On the subject of Railways he would feel particularly at home, having had much experience in their survey and formation while in England, and he confidently hopes that he would give satisfaction in all the other branches of the Profession.

Apply to the Office of this paper, 132 Nassau-st, or to Dr. Bartlett, at the office of the Albion, Cedar-street.

TO PLOUGHMEN.

THE Subscriber has upwards of three hundred acres of meadow land, in the sod, near the city of New York, that he wishes to have PLOUGHED, as early in the course of the next year as practicable. He wishes to CONTRACT for the whole, or any part. It must be ploughed four inches deep, the furrow must be turned completely over, so that the whole will lie flat—to plough a great part of this land advantageously and speedily, a double team of light cattle is preferable to one pair of heavy oxen. Provender for men and cattle can be procured on the premises. Apply by letter, directed to Anthony Dey, 63 Cedar-street, corner Nassau-street, New-York, by mail or otherwise, stating terms etc.

rr4t—f2in—48 A. DEY.

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do caststeel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron 4—vtf

FRAME BRIDGES.

THE subscriber would respectfully inform the public, and particularly Railroad and Bridge Corporations that he will build Frame Bridges, or vend the right to others to build, on Col. Long's Patent, throughout the United States, with few exceptions. The following sub-Agents have been engaged by the undersigned who will also attend to this business, viz.

Horace Childs,	Henniker, N. H.
Alexander McArthur,	Mount Morris, N. Y.
John Mahan,	do do
Thomas H. Cushing,	Dover, N. H.
Ira Blake,	Wakefield, N. H.
Amos Whitemore, Fsq.,	Hancock, N. H.
Samuel Herrick,	Springfield, Vermont.
Simeon Herrick,	do do
Capt. Isaac Damon,	Northampton, Mass.
Lyman Kingsly,	do do
Elijah Halbert,	Waterloo, N. Y.
Joseph Hebard,	Dunkirk, N. Y.
Col. Sherman Peck,	Hudson, Ohio.
Andrew E. Turnbull,	Lower Sandusky, Ohio.
William J. Turnbull,	do do
Sabried Dodge, Esq.,	(Civil Engineer,) Ohio.
Booz M. Atherton, Esq.	New-Philadelphia, Ohio.
Stephen Daniels,	Marietta, Ohio
John Rodgers,	Louisville, Kentucky.
John Tililson,	St. Francisville, Lous'a.
Capt. John Bottom,	Tonawanda, Penn
Nehemiah Osborn,	Rochester, N. Y.

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawawkeag river on the Military road, in Maine. On the national road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contocook river at Hancock, N. H. Across the Connecticut river at Haverhill, N. H. Across the Contocook river, at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Kennebec river, at Waterville, in the state of Maine.—Across the Genesse river, at Mount Morris, New-York, and several other bridges are now in progress.

The undersigned has removed to Rochester, Monroe county, New-York, where he will promptly attend to orders in this line of business to any practicable eextent in the United States, Maryland excepted.

MOSES LONG.
General Agent of Col. S. H Long
Rochester, May 22d, 1836. 19y-tf.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS

Also, Flange Tires, turned complete

18 ROGERS, KETCHUM & GROSVENOR

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation. J25tf

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size. Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

H. R. DUNHAM & CO.
4—vtf